REINVENT SMARTPHONE PHOTOGRAPHY

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REINVENT SMARTPHONE PHOTOGRAPHY

Blending superior hardware and software with Leica dual lenses, the Huawei P9 enables you to capture high quality pictures without compromising on the handset’s sleek and compact style.

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Capture more light with two sensors, one RGB and one monochrome. Get incredible shots with the Huawei P9’s merging algorithm, which intelligently combines the colours taken by the RGB sensor with the detail of the monochrome sensor.
Welcome from Tadeusz Więckowski, Conference Chairman

Ladies and Gentlemen,
Dear Participants, Guests, Friends and Colleagues,

It is my great honour and pleasure to welcome you all to EMC Europe 2016, to Wrocław and to Wrocław University of Science and Technology where an International Symposium on electromagnetic compatibility problems was organized for the first time in Europe in 1972.

Six years have passed since the EMC Europe Conference in Wrocław in 2010 when we celebrated the merger of the youngest and oldest International Symposia on Electromagnetic Compatibility organized in Europe. The success of EMC Europe conferences held in York, Rome, Brugge, Gothenburg and Dresden demonstrates that EMC Europe is the most important conference dealing with the subject in Europe and that integration of the European and international EMC research community has become a reality.

These six years have also seen new challenges for my university and the city. You will see all around you how numerous projects and investments have been effected.

Wrocław is over 750 years old. It is a friendly, historical, cosmopolitan and fast developing city with many historical and cultural places of interest and is often called ‘the city of bridges’ thanks to the Oder river and its many islands. This year, as European Capital of Culture, Wrocław has even more to offer. I do hope you will have the opportunity to enjoy some cultural events as well as feel the spirit and atmosphere of this young at heart city with its 11 universities and over 120 000 students.

Many interesting papers will be presented during this conference. More than 200 regular papers were submitted and assessed by our Editorial Board consisting of 92 international referees. The papers have been arranged into 19 topic sessions and 3 poster sessions. There will also be a number of workshops and tutorials. Sessions devoted to spectrum management and spectrum engineering issues have always been part of the International Wrocław Symposia on EMC. In order to uphold this tradition, a ‘Frequency Policy and Spectrum Engineering’ workshop will be held on Thursday and Friday in co-operation with the National Telecommunications Institute.

We can look forward to two keynote speeches which will be given during the conference by Jianqing Wang from Nagoya Institute of Technology in Japan and Luiz Da Silva from Trinity College Dublin in Ireland.

I would like extend my thanks to the authors of papers and organisers of the sessions, workshops and tutorials for their contribution to the conference program. Special thanks go to the International Steering Committee and a large group of reviewers for their support in evaluating the papers submitted. I would also like to thank our sponsors for their support and our exhibitors for their contributions. I would personally also like to thank my colleagues from the Local Organising Committee for their work in arranging the conference as well as Wrocław University of Science and Technology for its administrative support.

Thank you very much for your participation in the EMC EUROPE 2016 Conference. I hope the meeting will be valuable for all of you and I wish you a pleasant stay in Wrocław.

I wish success for subsequent EMC Europe conferences and I invite you to the next event - EMC Europe 2017, to be organized by our French colleagues in Angers next year.

Professor Tadeusz W. Wieckowski
Chairman of the Local Organizing Committee
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Conference Information

Oral Sessions

Each paper assigned to oral session is allowed for about 20 minutes presentation (including about 3 minutes for discussion). In sessions with 4 presenting papers it is possible to extend the presentation time up to 23 minutes. Detailed time schedule has been defined for each oral session in final programme.

Video projectors and computers (MS Power Point and Acrobat reader) are available for presentation in each conference room.

Authors must meet their session chairman in the room at least 15 minutes before the beginning of the session. Each speaker must give a short biography to the chairman and load the presentation in the computer, if did not send it before to the organizers. Only presentations provided on pendrives will be accepted for upload. The use of personal notebooks for presentation is not allowed.

Poster presentations

Each poster board will be marked with the poster ID-number, which can be found in the final conference programme as well. Authors are required to use only the boards corresponding to their posters.

Poster presenters have to hang up their poster on the day of their presentation 15 minutes before poster session. The authors will need to stay personally just during their poster session and to remove their posters from the boards after the poster session. Posters left on the boards after the poster sessions, will not be returned by the organisers.

Posters should be fixed to the poster board using materials (adhesive tapes or drawing pins) which will be provided on site.

The display area dedicated for presenting of poster of A0 size has the following dimension: approx. 84.1 cm wide and 118.9 height).

Internet Access

Participants equipped with computers and other mobile equipments with wireless card 802.11b/g/n will be able to take advantage of the wireless LAN facility installed in the conference building, enabling them to connect to the Internet network. The dedicated wireless network for Symposium participant is EMC2016 with password emceurope.

It is possible to connect to the Internet using free access Pwr-WiFi wireless network, but for limited types of services and IP ports. Participants from universities can take advantage of protected eduraom wireless LAN.
Mobile Conference assistant - Conference4Me

The Conference4Me smartphone application provides you with the most comfortable tool for browsing the complete programme of EMC Europe 2016 and planning your participation in this conference. Conference4Me application allows you directly from your phone or tablet to create your very own agenda on the fly. The Conference4Me application is available for free for Android, iOS, Windows Phone and Amazon Kindle Fire devices.

To download the mobile app, please visit http://conference4me.eu/download or search for “conference4me” in Google Play, iTunes App Store, Windows Phone Store or Amazon App Store, respectively, or scan codes below.

Venue

The EMC Europe 2016 symposium will take place in Wroclaw (Poland) on the main campus of the Wroclaw University of Science and Technology (WUST).

The main Campus of WUST is located in the Wroclaw city center. The opening ceremony as well as keynote 1 will be held in assembly hall (Aula) of the main building (building A-1) of WUST (Wybrzeże Wyspiańskiego 27).

Oral sessions, poster sessions, workshops and tutorials will be held in building C-13 of WUST, (Wybrzeże Wyspiańskiego 23/25). For details see the Campus map at the end of programme.

Badges

All delegates will receive a badge and invitations for social events during registration. For your convenience please wear your badge throughout the conference, even at the social events. The badge is multifunctional – see details in the following sections (Transport in Wroclaw, Lunch).
Transport in Wroclaw

Trams, buses, and taxis are at your disposal. A one-way tram and bus ticket costs 3,00 zloty. Fast buses are marked with capital letters (express buses), and tickets for them cost 3,20 zloty. In both cases price does not depend on the distance travelled. Passengers must validate the tickets. Tickets are sold in the newspaper kiosks.

In the days from 5 to 9 September 2016 all symposium participants can use the public transport using their badges as seasons ticket. The only badge allows transferring without ticket.

Lunch

Lunch is served in the canteen, in building C-18 (see map at the end of programme). For your disposal is a ground and first floor, please follow the guidance of canteen crew. Admission ticket is bagde so please bring it with you. Enjoy your meal!

Welcome Coctail

Tuesday, September 6th at 18:00

The Local Organizing Committee cordially invites to attend the Welcome Coctail in the Main Building (A-1) of Wroclaw University of Science and Technology. It's unique opportunity to meet with your colleagues and exhibitors in an informal atmosphere.

Symposium Banquet

Wednesday, September 7th at 20:00

The Local Organizing Committee cordially invites to attend the Symposium Banquet in DoubleTree by Hilton. During the banquet the Best Paper and Best Student Paper will be awarded.

DoubleTree by Hilton is located at Podwale 84, closed to Dominikanski Sq. in the city centre. Please remember about your invitation.
Welcome to EMC EUROPE 2017 in Angers, France

On behalf of the International Steering Committee, I am delighted and privileged to welcome you and your families to the major European conference on EMC, from 4 to 7 September in Angers, one of the best cities of good living in France.

Angers, located in the Loire Valley (1.5 hour from Paris by train), is classified by UNESCO as a World Heritage for Humanity. For many centuries, it has evolved from an ancient city into a flagship of modern technology, receiving the FrenchTech label for its contribution to the Internet of Things while keeping its traditional character.

EMC Europe 2017 focuses on the high quality of scientific and technical contributions as well as the fruitfulness of exchanges among EMC researchers and practitioners from all over the world, in a spirit of openness and conviviality. The conference will cover the whole spectrum of EMC topics, including emerging trends. Special sessions, workshops, tutorials and a large exhibition will be organized along with regular sessions.

Angers is a place where the ‘French way of life’ expression takes on its full meaning. From castles to wine-tasting, from sightseeing to good food, you will not be disappointed with your stay.

Join us in EMC Europe 2017 for an experience you will never forget!

Mohamed Ramdani, Conference Chair

Important Dates

- Proposals Deadline: 15 February 2017
- Notification of Acceptance: 17 April 2017
- Final Submission Deadline: 15 May 2017
- Reduced Fee Registration Deadline: 15 May 2017

More details: www.emceurope2017.org

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<td>2018 – Long Beach, California, USA</td>
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<td>2019 – Barcelona, Spain</td>
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<td>2020 – Reno, Nevada, USA</td>
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Committees

International Steering Committee (ISC)

Chairman: A. C. Marvin (United Kingdom)
Vice-Chairman: J. Carlsson (Sweden)

P. Besnier (France)  F. Maradei (Italy)
F.G. Canavero (Italy) V. Mariani Primiani (Italy)
J. Carlsson (Sweden) A. C. Marvin (United Kingdom)
J. Catrysse (Belgium) G. Peres (France)
M. D’Amore (Italy) D. Pissoort (Belgium)
P. Degauque (France) F. Rachidi (Switzerland)
A.P.J. van Deursen (The Netherlands) M. Ramdani (France)
M. Feliziani (Italy) F. Sabath (Germany)
H. Garbe (Germany) M.S. Sarto (Italy)
J.L. ter Haseborg (Germany) F. Silva (Spain)
Z. Joskiewicz (Poland) D. Thomas (UK)
M. Klingler (France) T.W. Wieckowski (Poland)
F.B.J. Leferink (The Netherlands)

Local Organizing Committee

Chairman: T. W. Wieckowski (Wroclaw University of Science and Technology)
Vice-Chairman: Z. Joskiewicz (Wroclaw University of Science and Technology)
Technical Program Chairman: G. Maslowski (Rzeszów University of Technology)

R. Zielinski (Workshops and Tutorials) – Wroclaw University of Science and Technology
J. Janiszewski (Sponsoring) – Wroclaw University of Science and Technology
A. Kozlowska (Reception Desk Coordinator) – Wroclaw University of Science and Technology
A. Florek & T. Utkowski (Exhibition) – Wroclaw University of Science and Technology
B. Andrasz (Secretariat and Reception Desk) – Wroclaw University of Science and Technology
K. Aniserowicz – Bialystok University of Technology
A. Karwowski – Silesian University of Technology (Gliwice)
D. Klepacki – Rzeszów University of Technology
A. Kucharski – Wroclaw University of Science and Technology
M. Wnuk – Military University of Technology (Warsaw)
A. Sowa – Wroclaw University of Science and Technology
International Reviewer’s Board

Karol Aniserowicz (Poland)  Christophe Lemoine (France)
Keith Armstrong (United Kingdom) Wojciech Machczynski (Poland)
Hideki Asai (Japan) Francesca Maradei (Italy)
Bruno Audone (Italy) Valter Mariani Primiani (Italy)
Mats Gösta Bäckström (Sweden) Chris Marshman (United Kingdom)
Adrijan Baric (Croatia) Grzegorz Masłowski (Poland)
Sven Battermann (Germany) Wolfgang Mathis (Germany)
Veronique Beauvois (Belgium) Carlo Mazzetti (Italy)
Philippe Besnier (France) Marek Piotr Michalak (Poland)
Pawel Bienkowski (Poland) Rafal Namiotko (Poland)
Bart Boesman (Belgium) Leszek Nowosielski (Poland)
Frits Buesink (Netherlands) Antonio Orlandi (Italy)
Jan Carlsson (Sweden) Joan Peuteman (Belgium)
Johan Catrysse (Belgium) Vladimir Pilinsky (Ukraine)
Graziano Cerri (Italy) Davy Pissoot (Belgium)
Christos Christopoulos (United Kingdom) Emanuele Pizzi (Italy)
Renato Cicchetti (Italy) Andrew Podgorski (Canada)
Mart Coenen (Netherlands) Hugo Pues (Belgium)
Marcello D Amore (Italy) Farhad Rachidi (Switzerland)
John Dawson (United Kingdom) Mohamed Ramdani (France)
Pierre Degauque (France) Blaise Ravelo (France)
Richard Edward DuBroff (United States) Anne Roč’h (Netherlands)
Alistair Duffy (United Kingdom) Vesna Roje (Croatia)
Mauro Feliziani (Italy) Marcos Rubinstein (Switzerland)
Stephan Frei (Germany) Alastair Ruddle (United Kingdom)
Osamu Fujiwara (Japan) Wiesław Sabat (Poland)
Heyno Garbe (Germany) Frank Sabath (Germany)
Renaud Gillon (Belgium) Jaroslaw Sadowski (Poland)
Frank Gronwald (Germany) Maria Sabrina Sarto (Italy)
Zbigniew Tadeusz Hanzelka (Poland) Christian Schuster (Germany)
Christopher Holloway (United States) Ramiro Serra (Netherlands)
Todd Hubing (United States) Ferran Silva (Spain)
Jarosław M. Janiszewski (Poland) Jacek Skrzyczynski (Poland)
Zbigniew Jóskiewicz (Poland) Andrzej Edward Sowa (Poland)
Yoshio Kami (Japan) Jan Luiken ter Haseborg (Germany)
Kazimierz Waclaw Kamuda (Poland) David Thomas (United Kingdom)
Andrzej Karwowski (Poland) Alexander van Deursen (Netherlands)
Dariusz Klepacki (Poland) Gyorgy Varju (Hungary)
Marco Klingler (France) Ralf Vick (Germany)
Jim Knighten (United States) Jan Welinder (Sweden)
Klaus-Dieter Kruse (Germany) Dariusz Więcek (Poland)
Ireneusz Kubiak (Poland) Kia Wiklundh (Sweden)
Andrzej Kucharski (Poland) Perry Wilson (United States)
Yury Kuznetsov (Russia) Ryszard J. Zielinski (Poland)
Frank Leferink (Netherlands) Robert Ziembia (Poland)
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## Best Students Paper Award nominee

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<td>The University of Nottingham, United Kingdom</td>
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<td>Akita Prefectural University, Japan</td>
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<td>¹IETR-UMR CNRS 6164, Rennes, France; ²CEA, DAM, GRAMAT, F-46500, Gramat, France</td>
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<td>¹University of York, United Kingdom; ⁶Huawei Technologies Co. Ltd, Shenzhen, People’s Republic of China</td>
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<td>¹University of Twente, Enschede, The Netherlands; ²Electromagnetic Laboratory, TUBITAK UME, Kocaeli/Turkey; ³EMC Laboratory INTA, Madrid, Spain; ⁶Thales Netherlands, Hengelo, The Netherlands; ⁶Research Center for quality System and Testing Technology - LIPI, Serpong, Indonesia; ⁶Czech Metrology Institute, Electromagnetic Compatibility Laboratory, Brno, Czech Republic</td>
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<td>¹IITB-MONASH RESEARCH ACADEMY, IIT-Bombay, India; ²MONASH University, AUSTRALIA</td>
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### Schedule at glance

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## Monday, 5th September 2016 – Workshops & Tutorials

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<tr>
<th>TIME</th>
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<tbody>
<tr>
<td>10:30</td>
<td>Coffee break</td>
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<td>(conference building C-13, hall)</td>
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<tr>
<td>11:00</td>
<td>Workshop 1A</td>
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<td></td>
<td>Techniques for Measurement and Characterisation of complex multi-functional (digital) systems (1)</td>
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<td>Organizer/Chair: David Thomas</td>
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<td>University of Nottingham - United Kingdom</td>
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<td>Tutorial 1A</td>
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<td>EMC for Large Installations (1)</td>
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<td>Organizer/Chair: Frits Buesink</td>
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<td>University of Twente - The Netherlands</td>
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<td>12:30</td>
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<td>(Canteen, building C-18, Hoene-Wronskiego Str. 10)</td>
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<td>14:00</td>
<td>Workshop 1B</td>
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<td>Techniques for Measurement and Characterisation of complex multi-functional (digital) systems (2)</td>
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<td>16:00</td>
<td>Workshop 5</td>
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<td>New AECTP 500 and MIL-STD 461G</td>
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<td>Tutorial 1C</td>
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<td>EMC for Large Installations (3)</td>
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<td>Organizer/Chair: Frits Buesink</td>
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<td>University of Twente - The Netherlands</td>
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<td>Workshop 6</td>
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<td>Power versus Field: A Novel Approach to Immunity Testing above 1 GHz</td>
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<td>Organizer/Chair: Ammar Sarwar Lukasz Wilk</td>
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<td>ETS Lindgren (EMEA)</td>
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**Tutorials**

**TUT 1**

TUTORIAL 1

**EMC FOR LARGE INSTALLATIONS**

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<th>Time: 11:00 - 17:30</th>
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<td>Chaired by: Frits Buesink, University of Twente, the Netherlands</td>
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<td>Room: B (C-13)</td>
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<td>Speakers: Frits Buesink (University of Twente)</td>
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<tr>
<td>Sessions:</td>
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<tr>
<td><strong>TUT 1A</strong> (11:00 - 12:30)</td>
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<td>Lunch</td>
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<tr>
<td><strong>TUT 1C</strong> (16:00 - 17:30)</td>
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Abstract:

Building large installations that perform their tasks over their full lifetime undisturbed by electromagnetic effects within and outside the installation is no trivial matter. This tutorial conveys this message using many practical experiments and demonstrations first to show the relevant electromagnetic phenomena and then effective measures to mitigate their influence. The main objective is awareness of the effects and how complex installations can be hierarchically decomposed into electromagnetically independent modules. This allows for abstraction and the task of integrating these modules is manageable as the integrator can focus on the module specifications without the burden of hidden interference risks.

Programme:

**TUT 1A session**

EMC for Large Installations

Frits Buesink (1), Kees Post (2)

(1) University of Twente, Enschede, the Netherlands
(2) Lambda Engineering, Hilversum, the Netherlands

**TUT 1B session**

EMC for Large Installations (continuation)

Frits Buesink (1), Kees Post (2)

(1) University of Twente, Enschede, the Netherlands
(2) Lambda Engineering, Hilversum, the Netherlands

**TUT 1C session**

EMC for Large Installations (continuation)

Frits Buesink (1), Kees Post (2)

(1) University of Twente, Enschede, the Netherlands
(2) Lambda Engineering, Hilversum, the Netherlands
## Workshops

### WS 1

**WORKSHOP 1**

**Time:** 11:00 - 15:30

**Techniques for Measurement and Characterisation of Complex Multi-functional (Digital) Systems**

**Chaired by:** Dave Thomas, University of Nottingham, UK

**Room:** A (C-13)

**Speakers:**

- Dave Thomas (University of Nottingham), Anders P. Mynster (DELTA), Johannes A. Russer (Technical University of Munich), S. L. Parker (University of York), A. C. Marvin (University of York), J. F. Dawson (University of York), Yury Kuznetsov (Moscow Aviation Institute), Andrey Baev (Moscow Aviation Institute)

**Abstract:**

The development of high performance and highly integrated miniature electronic systems with increased functionality makes the assessment of electromagnetic interference more complex. Particular challenges will be the wideband communications, multiple modulated digital clocks with time dependent emissions and immunity. Immunity levels will also decrease due to lower supply voltages and lower signal power levels. Traditionally, the potential EMI sources were assessed in the frequency domain assuming static emissions. This is not valid for multifunctional devices with many operating modes. New approaches that fully account for time dependence and uncertainty are needed.

The workshop will present some state-of-the-art methods and experiences in the measurement of complex electronic devices.

**Primary Audience:**

Product designers, test engineers, product regulatory personnel and those that work on EMC measurement and design standards.

Workshop is sponsored by COST IC 1407: Advanced Characterisation and Classification of Radiated Emissions in Densely Integrated Technologies (ACCREDIT)

**Programme:**

**WS 1A**

**session Time:** 11:00 - 12:30

**The time domain measurement and characterisation of Electromagnetic Interference from printed circuit boards**

Dave Thomas (1), Christopher Smartt (1), Gregor Tanner (2), Gabriele Gradoni (2), Stephen C. Creagh (2)

(1) The Department of Electrical and Electronic Engineering, University of Nottingham, UK
(2) The Department of Mathematical Sciences, University of Nottingham, UK

**EMC testing IoT devices and Drones**

Anders P. Mynster
DELTA – Danish electronics, lights and acoustics

**Modeling and Analysis of Stationary and Cyclostationary Noisy EM Fields**

Johannes A. Russer, Peter Russer
Technical University of Munich, Germany
WS 1B session

Modeling and Analysis of Stationary and Cyclostationary Noisy EM Fields (continuation)
Johannes A. Russer, Peter Russer
Technical University of Munich, Germany

Enclosure Shielding; Studies of the Effects of Circuit Cards in Enclosures and the use of Surrogate Circuit Cards for Shielding Measurement
S. L. Parker (1), I. D. Flintoft (1), A. C. Marvin (1), J. F. Dawson (1), S. J. Bale (1), M. P. Robinson (1) & J. Yan1 Ming Ye (2), Changyong Wan (2), Mengze Zhang2
(1) University of York, Department of Electronics
(2) HUAWEI Technologies

Cyclostationary characterization of unintentional stochastic radiations and time-domain detection of stochastic signals with cyclostationary properties
Yury Kuznetsov, Andrey Baev
Theoretical Radio Engineering Department, Moscow Aviation Institute (National Research University), Russian Federation

WS 2

WORKSHOP 2

EMC TROUBLESHOOTING METHODS AND NEW MEASUREMENT TECHNIQUES USING OSCILLOSCOPES

Chaired by: Mike Hertz, Teledyne LeCroy, USA

Room: C (C-13)

Speakers: Mike Hertz (Teledyne LeCroy)

Abstract:
This presentation provides new measurement and troubleshooting techniques for EMC testing using oscilloscopes and includes topics such as how thresholds affect pulse measurement, why standard pulse parameters are not compatible with EMC pulses, measurement thresholds for ESD pulses, sequenced acquisition for EFT (Electrical Fast Transient) burst analysis, parameter limiters applied to filter EMC pulse statistics, methods for performing EMC testing, ESD pulse verification, energy of the loaded pulse, voltage below battery, surge testing and how to perform accurate RC time constant measurements.

Programme:

WS 2A session

EMC Troubleshooting Methods and New Measurement Techniques Using Oscilloscopes
Mike Hertz
Teledyne LeCroy, United States of America

WS 2B session

EMC Troubleshooting Methods and New Measurement Techniques Using Oscilloscopes
Mike Hertz
Teledyne LeCroy, United States of America
**WS 3**  
**WORKSHOP 3**  
**HIGH POWER ELECTROMAGNETIC (HPEM) THREATS AND IMMUNITY TEST METHODS ATTACKS**  
**Chaired by:** Nicolas Mora, Montena Technology SA, Switzerland  
**Room:** D (C-13)  
**Time:** 11:00 - 12:30

**Speakers:**  
Nicolas Mora (Montena Technology SA)  

**Abstract:**  
In this workshop, a general overview of man-made high power electromagnetic (HPEM) interference sources is presented. The main immunity test methods according to some of the available standards are explained with an emphasis in protection against nuclear electromagnetic pulses (NEMP) according to the MIL standards.

**Programme:**

**WS 3 session**  
**Time:** 11:00 - 12:30

**High Power Electromagnetic (HPEM) Threats and Immunity Test Methods Attacks**  
Nicolas Mora  
Montena Technology SA, Switzerland

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**WS 4**  
**WORKSHOP 4**  
**DETECTION, LOCALIZATION AND IDENTIFICATION OF HPEM ATTACKS**  
**Chaired by:** Nicolas Mora, Montena Technology SA, Switzerland  
Werner Hirschi, Montena Technology SA, Switzerland  
**Room:** D (C-13)  
**Time:** 14:00 - 15:30

**Speakers:**  
Nicolas Mora (Montena Technology SA), Werner Hirschi (Montena Technology SA)  

**Abstract:**  
This workshop presents an overview of the capabilities of publicly reported high-power electromagnetic (HPEM) radiators, and the global considerations for their detection, identification and localization. A detection, identification and localization system that uses a novel approach for measuring the characteristics such signals with inexpensive, off-the-shelf components is also presented.

**Programme:**

**WS 4 session**  
**Time:** 14:00 - 15:30

**Detection, Localization AND Identification OF HPEM Attacks**  
Nicolas Mora, Werner Hirschi  
Montena Technology SA, Switzerland
**WS 5**

**WORKSHOP 5**

**NEW AECTP 500 AND MIL-STD 461G**

**Chaired by:** Frank Leferink, University of Twente – THALES, the Netherlands

**Room:** A (C-13)

**Speakers:** Frank Leferink (University of Twente – THALES)

**Sessions:**

**WS 5**

**Time:** 16:00 - 17:30

**Abstract:**

The MIL-STD 461G has been published in December 2015 and the NATO AECTP 500 in January 2016. The NATO STANAG 4370, which contains the AECTP procedures, is the preferred standard for defence procurement in Europe. The AECTP is also the preferred standard to show compliance with the essential requirements of the European EMC Directive.

In this session we will discuss the changes: which test methods have been added, what has been removed, and what are the consequences for industry and ministries of defence (MoDs). Some AECTP 500 parts remained the same, but for instance the AECTP 507 has been completely re-written and now contains much more best-practices from especially the German VG and United Kingdom Def-Stan standards.

**Programme:**

**WS 5 session**

**Time:** 16:00 - 17:30

**New AECTP 500 and MIL-STD 461G**

Frank Leferink

University of Twente - THALES, the Netherlands

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**WS 6**

**WORKSHOP 6**

**POWER VERSUS FIELD: A NOVEL APPROACH TO IMMUNITY TESTING ABOVE 1 GHz**

**Chaired by:** Lukasz Wilk, ETS Lindgren (EMEA)

**Room:** C (C-13)

**Speakers:** Ammar Sarwar (ETS Lindgren (EMEA)), Lukasz Wilk (ETS Lindgren (EMEA))

**Sessions:**

**WS 6**

**Time:** 16:00 - 17:30

**Abstract:**

An EMField generator is shown as a novel, integrated solution for radiated immunity testing, including IEC 61000-4-3. The novel solution combines an amplifier, directional couplers, and an antenna array into one simplified and compact design to support fully compliant testing. It is shown that virtually all of the generated power is converted into useable field strength. The presentation includes a review of theory, design concept, functionality, setup configuration, main applications and more.

**Programme:**

**WS 6 session**

**Time:** 16:00 - 17:30

**Power versus Field: A Novel Approach to Immunity Testing above 1 GHz**

Ammar Sarwar, Lukasz Wilk

ETS Lindgren (EMEA)
WS 7
WORKSHOP 7
Time: 16:00 - 17:30

AUTOMATION OF EMI TESTING USING A TIME DOMAIN EMI MEASUREMENT SYSTEM UP TO 40 GHz

Chaired by: Stephan Braun, Gauss Instruments, Germany
Room: D (C-13)

Speakers: Stephan Braun (Gauss Instruments), Arnd Frech (Gauss Instruments), Denny Prawira (Gauss Instruments)

Sessions:

WS 7
(16:00 - 17:30)

Abstract:

With the integration of the FFT-based measuring instrument into the basic standards and product standards for commercial and military application also new test procedures become available to perform automated EMI testing.

The operation and the mathematical equivalence of the FFT-based measuring instrument is discussed.

Based on the example of a time-domain EMI measurement system with 645 MHz real-time Bandwidth and 6 GHz Real-time scanning bandwidth measurement procedures are presented to perform conducted, disturbance power, radiated emission Measurements from DC - 40 GHz. The measurement procedures are compared with the conventional procedures that are today performed with superheterodyne receivers.

Strategies that combine both methods are also discussed.

Programme:

WS 7 session
Time: 16:00 - 17:30

Automation of EMI Testing Using a Time Domain EMI Measurement System up to 40 GHz
Stephan Braun, Arnd Frech, Denny Prawira
Gauss Instruments, Munich Germany

Meetings

MEETING 9
MEETING OF EXPERT GROUP 7 - EEE OF EDSTAR
Time: 14:00 - 15:30
Chaired by: Frank Leferink, University of Twente - THALES, the Netherlands
Room: F (C-13)

MEETING 1
COST IC 1407 MEETING
Time: 16:00 - 18:00
Chaired by: Dave Thomas, University of Nottingham, UK
Room: E (C-13)

MEETING 2
IEC SC77B AND CISPR-A JWG "REVERBERATION CHAMBER" MEETING
Time: 17:00 - 18:00
Chaired by: Mathias Magdowski, Otto von Guericke University, Germany
Room: F (C-13)
## Tuesday, 6th September 2016 – 1st Symposium day

<table>
<thead>
<tr>
<th>TIME</th>
<th>SESSION or BREAK</th>
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<tbody>
<tr>
<td>9:00</td>
<td><strong>Opening ceremony</strong>&lt;br&gt;Chairs: Tadeusz W. Więckowski, Grzegorz Maslowski (Location: building A1, Aula)</td>
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<tr>
<td>9:30</td>
<td><strong>Keynote 1</strong>&lt;br&gt;Chair: Grzegorz Masłowski (location: building A1, Aula)</td>
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<td><strong>Coffee break</strong> (conference building C-13, hall)</td>
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### Rooms

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<tr>
<td>11:00</td>
<td>Room A (bldg. C-13 / 1.31)</td>
<td>OS 1A (O_Tu_A1)&lt;br&gt;Measurement Techniques (1)&lt;br&gt;Chair: Davy Pissoort&lt;br&gt;KU Leuven, Belgium</td>
<td>Room B (bldg. C-13 / 1.30)</td>
<td>OS 2A (O_Tu_B1)&lt;br&gt;EMC Analysis, Modelling, Prediction (1)&lt;br&gt;Chair: Mohamed Ramdani&lt;br&gt;ESEO, France</td>
<td>Room C (bldg. C-13 / 1.28)</td>
<td>OS 3 (O_Tu_C1)&lt;br&gt;Standards&lt;br&gt;Chair: Zbigniew Joklewicz&lt;br&gt;Wroclaw Univ. of Science and Technology, Poland</td>
<td>Room E (bldg. C-13 / 0.31)</td>
<td>Meeting 3&lt;br&gt;IEEE EMC-S PL &amp; EMC Section (KEiT PAN)&lt;br&gt;Technical Meeting&lt;br&gt;Chair: Grzegorz Maslowski&lt;br&gt;Rzeszow University of Technology, Poland</td>
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<td>14:00</td>
<td>Room A (bldg. C-13 / 1.31)</td>
<td>OS 1B (O_Tu_A2)&lt;br&gt;Measurement Techniques (2)&lt;br&gt;Chair: Andy Marvin&lt;br&gt;University of York, York EMC Services, United Kingdom</td>
<td>Room B (bldg. C-13 / 1.30)</td>
<td>OS 2B (O_Tu_B2)&lt;br&gt;EMC Analysis, Modelling, Prediction (2)&lt;br&gt;Chair: Jan Carlsson&lt;br&gt;Provin, Sweden</td>
<td>Room C (bldg. C-13 / 1.28)</td>
<td>OS 4 (O_Tu_C2)&lt;br&gt;Smart meters and PLC&lt;br&gt;Chair: David Thomas&lt;br&gt;University of Nottingham, United Kingdom</td>
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<td>Room A (bldg. C-13 / 1.31)</td>
<td>OS 1C (O_Tu_A3)&lt;br&gt;Measurement Techniques (3)&lt;br&gt;Chair: Jan Luiken ter Haseborg&lt;br&gt;Hamburg University of Technology, Germany</td>
<td>Room B (bldg. C-13 / 1.30)</td>
<td>OS 2C (O_Tu_B3)&lt;br&gt;EMC Analysis, Modelling, Prediction (3)&lt;br&gt;Chair: Valter Mariani Primiani&lt;br&gt;Universita Politecnica delle Marche, Italy</td>
<td>Room C (bldg. C-13 / 1.28)</td>
<td>OS 5 (O_Tu_C3)&lt;br&gt;Power electronics and systems&lt;br&gt;Chair: David Thomas&lt;br&gt;University of Nottingham, United Kingdom</td>
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OPENING CEREMONY

Chaired by: Tadeusz W. Wieckowski, Grzegorz Maslowski

Welcome addresses:

- **Prof. Dr.-Ing. Tadeusz W. Więckowski**, EMC Europe 2016 Wroclaw Symposium Chair
  Wroclaw University of Science and Technology, Poland

- **Prof. Andy Marvin**, Chairman of the International Steering Committee (ISC) of EMC Europe
  University of York, York EMC Services Ltd, United Kingdom

- **Prof. Heyno Garbe**, Vice President of the IEEE EMC Society - Member Service
  Leibniz University of Hannover, Germany

- **Prof. Mohamed Ramdani**, EMC Europe 2017 Angers Symposium Chair
  ESEO Institute of Science and Technology, France

- **Dr. Zbigniew Jóskiewicz**, EMC Europe 2016 Wroclaw Symposium Vice-Chair
  Wroclaw University of Science and Technology, Poland

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KEYNOTE 1

Chaired by: Grzegorz Maslowski

EMI Evaluation and Immunity Testing Methods for Wearable devices
Jianqing Wang
Nagoya Institute of Technology, Japan

Abstract:

Increasing aging population is leading to a wide-scale demand in healthcare and medical applications. This makes various wearable devices with vital signal sensing and communication functions be developed and put into the market in a high speed. However, EMC evaluation and immunity testing methods for these wearable devices have not been well established because of their too rapid advances.

This talk consists of two parts. In the first part, we will show a two-step approach to quantitatively evaluate the EMI for a wearable device in the design stage. The approach combines electromagnetic field analysis and electronic circuit analysis, and clarifies that the main reason for changing a common mode interference voltage induced by external electromagnetic field into a differential mode interference voltage is due to an imbalance of impedance in the vital signal sensing circuits. In the second part, we will introduce an immunity testing system which consists of a pseudo vital signal generator and a biological-equivalent phantom. By applying this testing system to an artificial hand system in an electrostatic discharge (ESD) test, we demonstrate its usefulness for immunity testing of wearable devices.
Oral sessions

OS 1A (O_Tu_A1) ORAL SESSION Time: 11:00 - 12:30
MEASUREMENT TECHNIQUES (1)
Chaired by: Davy Pissoort, KU Leuven, Belgium Room: A (C-13)

11:00 Localization of the Equivalent Sources on the PCB Surface by Using Ultra-Wideband Time Domain Near-Field Measurements
Yury Kuznetsov1, Andrey Baev1, Anastasia Gorbunova1, Maxim Konovalyuk1, David Thomas2, Christopher Smartt2, Mohd H. Baharuddin3, Johannes A. Russer3, Peter Russer1
1Moscow Aviation Institute (National Research University), Moscow, Russian Federation; 2University of Nottingham, Nottingham, United Kingdom; 3Technische Universitaet Muenchen, Munich, Germany

11:22 Measurement and Wigner Function Analysis of Field-Field Correlation for Complex PCBs in Near Field
Mohd Baharuddin, Hayan Nasser, Chris Smartt, David Thomas, Gabriele Gradoni, Stephen Creagh, Gregor Tanner
The University of Nottingham, United Kingdom

11:45 Correlation Measurement and Evaluation of Stochastic Electromagnetic Fields
Johannes A. Russer1, Michael Haider1, Mohd Baharuddin2, Christopher Smartt2, Andrey Baev3, Sidina Wane4, Damienne Bajan5, Yury Kuznetsov1, David Thomas2, Peter Russer1
1Technische Universität München, Germany; 2University of Nottingham; 3Moscow Aviation Institute; 4NXP-Semiconductors; 5ISAE-Universite de Toulouse

12:07 Near-Field Measurement Based Prediction of Antenna Test Results below 30 MHz in CISPR 25 Setups
Zongyi Chen, Stephan Frei
TU Dortmund University, Germany

OS 2A (O_Tu_B1) ORAL SESSION Time: 11:00 - 12:30
EMC ANALYSIS, MODELLING, PREDICTION (1)
Chaired by: Mohamed Ramdani, ESEO, France Room: B (C-13)

11:00 On the Choice of Huygens’ Surfaces in the Vicinity of Electrically Small Apertures
Fabian Happ, Gazmend Mavraj, Heinz-D. Brüns, Frank Gronwald
Technische Universität Hamburg-Harburg, Germany

11:22 Passivity Considerations for Sub-Gridded FDTD with Discrete Complex Wave Impedance
Ata Zadehgol
University of Idaho, United States of America

11:45 Transient Excitation of Nonlinearly Loaded Resonators and Observation of System Responses in Time Domain
Miroslav Kotzev1, Matthias Kreitlow2, Frank Gronwald1
1Technische Universität Hamburg-Harburg, Hamburg, Germany; 2Bundeswehr Research Institute for Protective Technology and NBC Protection Munster, Germany

12:07 A Novel Method for Equivalent Circuit Synthesis from Frequency Response of Multi-port Networks
Ata Zadehgol, Venkatesh Avula
University of Idaho, United States of America
## OS 3A (O_Tu_C1) Standards

**Chair:** Zbigniew Jóskiewicz, Wroclaw University of Science and Technology, Poland

**Time:** 11:00 - 12:30

**Room:** C (C-13)

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker(s)</th>
<th>Institution(s)</th>
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<tbody>
<tr>
<td>11:00</td>
<td>Updated AECTP 250 and AECTP 500 standards for military equipment, as preferred in EDSTAR</td>
<td>Frank Leferink(^1), Edwin van Bladel(^2)</td>
<td>University of Twente - THALES, The Netherlands; Royal Netherlands Air Force, The Netherlands</td>
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<tr>
<td>11:22</td>
<td>Study on test signals for radiated immunity test in close proximity to equipment</td>
<td>Naomichi Nakamura, Yuichiro Okugawa, Yoshiharu Hiroshima, Kazuhiro Takaya</td>
<td>NTT, Japan</td>
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<tr>
<td>11:45</td>
<td>EMC for the IoT</td>
<td>Anders Pilgaard Mynster, Per Thåstrup Jensen</td>
<td>DELTA, Denmark</td>
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<tr>
<td>12:07</td>
<td>Tackling the Issue of Non-Compliant Products with a New EMC Directive</td>
<td>Nick Wainwright</td>
<td>York EMC Services, United Kingdom</td>
</tr>
</tbody>
</table>

## OS 1B (O_Tu_A2) Measurement Techniques (2)

**Chair:** Andy Marvin, University of York, York EMC Services Ltd, United Kingdom

**Time:** 14:00 - 15:30

**Room:** A (C-13)

<table>
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<th>Time</th>
<th>Title</th>
<th>Speaker(s)</th>
<th>Institution(s)</th>
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<tbody>
<tr>
<td>14:00</td>
<td>A Study of The Effects of Truncation Errors on the Compensation of EMI Near-Field Probes</td>
<td>Tim Claeyss(^1,2), Guy A. E. Vandenbosch(^3), Davy Pissoort(^1,2)</td>
<td>KU Leuven Technology Campus Ostend, Department of Electrical Engineering, Remi, Ostend, Belgium; KU Leuven, Department of Electrical Engineering, MICroelectronics And Sensors, Herzelee, Belgium; KU Leuven, Department of Electrical Engineering, TELEcommunications and MICrowaves, Herzelee, Belgium</td>
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<td>14:22</td>
<td>Diagnosing EMI Problems Using Real-Time Spectrum Analysis</td>
<td>Mark Terrien</td>
<td>Keysight Technologies, United States of America</td>
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<tr>
<td>14:45</td>
<td>Hidden Aspects in CISPR 16-1-1 Full Compliant Fast Fourier Transform EMI Receivers</td>
<td>Mario Monti, Elena Puri, Massimo Monti</td>
<td>Elettronica Moni, Italy</td>
</tr>
<tr>
<td>15:07</td>
<td>Using Cs and Rb Rydberg Atoms Simultaneously for SI-Traceable RF Electric-Field Metrology via Electromagnetically Induced Transparency</td>
<td>Christopher Holloway, Matt Simons, Josh Gordon</td>
<td>NIST, United States of America</td>
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</tbody>
</table>
## OS 2B  (O_Tu_B2)  ORAL SESSION

### EMC ANALYSIS, MODELLING, PREDICTION (2)

#### Chaired by:
Prof. Jan Carlsson, Provinn, Sweden

#### Room:
B (C-13)

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
</table>
| 14:00  | Crosstalk characterization of fabrics elaborated with conductive yarns | Raúl Fernández-García¹, Ignacio Gil¹, Francesc Cano², Ferran Pares³  
¹Department of Electronic Engineering, Universitat Politecnica de Catalunya, Spain;  
²INTESTER, Universitat Politècnica de Catalunya, Spain;  
³Department of Textile and Paper Engineering, Universitat Politècnica de Catalunya, Spain |
| 14:22  | Crosstalk between wire pairs above a composite ground plane           | Jesper Lansink Rotgerink¹, Fabian Happ², Jan-Joris van Es¹  
¹Netherlands Aerospace Centre, Netherlands, The;  
²Technische Universität Hamburg-Harburg |
| 14:45  | Analysis of Transmission Characteristic of a Microstrip Line placed above a Ground Slot | Kunihiro Takamatsu, Teruo Tobana, Yoji Isota, Takayuki Sasamori  
Akita Prefectural University, Japan |
| 15:07  | Maximum Environmental Electric Field Using Extreme Value Theory     | Bruno Audone¹, Roberto Colombo²  
¹EMC Consultant, Italy;  
²IMQ EMC Lab manager |

## OS 3  (O_Tu_C2)  ORAL SESSION

### SMART METTERS AND PLC

#### Chaired by:
David Thomas, The University of Nottingham, United Kingdom

#### Room:
C (C-13)

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<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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</table>
| 14:00  | EMI Examination of the Low-Voltage Grid in the Frequency Range from 9 kHz to 2 MHz Focussing on Noise Level, Impedance, Attenuation and the Impact on PLC Data Transmission | Mike Trautmann¹, Sebastian Jeschke¹, Sascha Grigo¹, Margarethe Malek¹, Holger Hirsch¹, Tobias Pletzer¹, Christof Hartmann², Norbert van Lier², Sebastian Ponzelar³  
¹University Duisbug-Essen, Germany;  
²devolo AG, Germany |
| 14:22  | Investigation of Smart Meters Using G3 PLC                         | Margarethe Malek, Daniel Ketel, Holger Hirsch, Mike Trautmann  
University of Duisbug-Essen, Germany |
| 14:45  | EN50561-3: not an EMC Standard, but an Unacceptable Licence to Cause Interference | Frank Leferink¹,², Alain Alcaras³, Jaap Schuurmans², Maarten Appelman²,³  
¹THALES Netherlands, Hengelo, The Netherlands;  
²University of Twente, Enschede, The Netherlands;  
³Saxion University of Applied Science, Enschede, The Netherlands |
| 15:07  | Runaway Energy Meters due to Conducted Electromagnetic Interference | Frank Leferink¹,², Cees Keyer¹,², Anton Melentjev³  
¹University of Twente, Enschede, The Netherlands;  
²THALES, Hengelo, The Netherlands;  
³University of Applied Science, Amsterdam, The Netherlands |
OS 1C  (O_Tu_A3)  ORAL SESSION  Time: 16:00 - 17:30

MEASUREMENT TECHNIQUES (3)
Chaired by: Jan Luiken ter Haseborg , Hamburg University of Technology, Germany  Room:  A (C-13)

16:00  Proposal of Polarization Dependence Limit based on the Test Arrangement of Radiated Emission Measurement in FAR Test Site
Kunihiro Osabe¹, Shinichi Okuyama²
¹VCCI, Japan; ²NEC Platforms, Ltd.

16:22  Study on Improving the Reproducibility of Radiated Emission Measurement in a Fully Anechoic Room by Using VHF-LISN
Shinichi Okuyama¹, Nobuo Kuwabara², Masanori Yamaguchi³, Kunihiro Osabe⁴
¹VCCI Council / NEC Platforms, Ltd., Japan; ²Kyushu Institute of Technology; ³EMC Education; ⁴VCCI Council

16:45  Analysis and Verification of Test Site Validation Method by Using Newly Calculated NSA Values According to the Antenna Feed Point Below 30 MHz
Seungwoo Lee¹, Nam Kim¹, Hong-Sik Keum¹, Jun-Kyu Yang³
¹Chungbuk National University, Korea, Republic of South Korea; ²Korea Radio Promotion Association, Korea, Republic of South Korea; ³National Radio Research Agency, Korea, Republic of South Korea

17:07  Analysis of Repeatability and Uncertainty Issues in Radiated Emission Tests Regarding HDMI Ports
Sezgin Hilavin¹, Cem Cengiz Keskin¹, Engin Kodai¹, Ismail Y lmazlar¹, Emre Ardalı¹, İrem Hilavin²
¹Vestel Electronics, Turkey; ²Dokuz Eylül University the Graduate School of Natural and Applied Sciences, İzmir

OS 2C  (O_Tu_B3)  ORAL SESSION  Time: 16:00 - 17:50

EMC ANALYSIS, MODELLING, PREDICTION (3)
Chaired by: Prof. Valter Mariani Primiani, Università Politecnica delle Marche, Italy  Room:  B (C-13)

16:00  A Statistical Approach to Detect Immunity Degradations
Bruno Audone¹, Roberto Colombo²
¹EMC Consultant, Italy; ²IMQ EMC lab manager

16:20  Plane Wave Coupling to an Aerial Electrical Cable. Assessment of Extreme Interference Levels with the Controlled Stratification Method
Mourad Larbi¹,², Philippe Besnier¹, Bernard Pecqueux², Frédéric Puybaret²
¹IETR-UMR CNRS 6164, Rennes, France; ²CEA, DAM, GRAMAT, F-46500, Gramat, France

16:40  Simulation of Bulk Current Injection Test Using Integrated Circuit Immunity Macro Model and Electromagnetic Analysis
Yosuke Kondo¹,², Shinichiro Ueyama¹, Masato Izumichi¹, Osami Wada²
¹DENSO CORPORATION, Japan; ²Graduate School of Engineering, Kyoto University, Japan

17:10  Analysis of Electromagnetic Coupling Between Microstrip Line and Ground Slot on a Printed Circuit Board
Teruo Tobana, Takayuki Sasamori, Yoji Isota
Akita Prefectural University, Japan
18:30  A Method to Model Pigtails of Shielded Cables when Using the Combined MoM/MTL Approach  
Morgan Vincent¹,², Marco Klingler¹, Zouheir Riah², Yacine Azzouz²  
¹PSA Peugeot Citroen, DRD/DRIA/DSTF/SIEP, Vélizy-Villacoublay, France; ²IRSEEM/ESIGELEC, Electron. & Syst. Group, Saint-Etienne du Rouvray, France

OS 5  (O_Tu_C3)  ORAL SESSION  Time: 16:00 - 17:30  
POWER ELECTRONICS AND SYSTEMS  
Chaired by: David Thomas, The University of Nottingham, United Kingdom  
Room: C (C-13)

16:00  Frequency Domain EMI-Simulation and Resonance Analysis of a DCDC-Converter  
Philipp Hillenband¹, Jan Hansen², Martin Böttcher², Stefan Tenbohlen¹  
¹University of Stuttgart, Germany; ²Robert Bosch GmbH, Germany

16:22  Design by Optimization of Power Electronics Converter Including EMC Constraints  
Mylene DELHOMMAIS¹, Gnimdu DADANEMANA², Yvan AVENAS¹, Francois COSTA², Jean-Luc SCHANEN¹, Christian VOLLAIRE³  
¹G2ELab Univ Grenoble Alps, France; ²SATIE - ENS CACHAN, France; ³AMPERE - Ecole Centrale de Lyon, France

16:45  Determination of Radiated Emissions from Wind Energy Conversion Systems  
Sebastian Koj, Sven Fisahn, Heyno Garbe  
Leibniz Universitaet Hannover, Germany

17:07  A comparative study on conducted noise characteristics of SiC and GaN power transistor  
Takaaki Ibuchi, Tsuyoshi Funaki  
Osaka University, Japan

Posters

P 1  POSTER SESSION  Time: 13:30 - 15:30  
POSTER SESSION 1  
Chaired by: Tadeusz W. Więckowski, Tomasz Utkowski, Wroclaw Univ. of Science and Technology, Poland  
Poster area (C-13)

P1 (1)  Analysis of Shielding Effectiveness for Fiber Reinforced Composites with Microstructures of Rectangle Array of Inclusions  
Yi Liao¹, Liming Yuan¹, Jianfeng Shi², Yuan Zhang¹  
¹Shanghai Key Laboratory of Electromagnetic Environmental Effects for Aerospace Vehicle, People’s Republic of China; ²Shanghai Aircraft Design and Research Institute

P 1 (2)  Protection Criteria for Sharing Spectrum UE LTE-800 and Air-Traffic Control Radars Based on Experimental Comparability Results  
Valery Tikhvinskiy¹,², Grigory Bochechka¹,², Pavel Korchagin³, Shakhmaran Seilov⁴, Andrey Gryazev⁵  
¹Icominvest, Russian Federation; ²Moscow Technical University of Communications and Informatics, Russian Federation; ³Geyser-Telecom Ltd, Russian Federation; ⁴L.N. Gumilyov Eurasian National University, Kazakhstan; ⁵Federal State Unitary Enterprise Central Science Research Telecommunication Institute, Russian Federation
P 1 (3)  Multisystem microstrip antenna
Leszek Nowosielski, Marian Wnuk, Mariusz Gruszczynski
Military University of Technology, Poland

P 1 (4)  Software and hardware assessment of FDTD simulations for very large and complex scenes
Laurent LABARBE, Bernard PECQUEUX
CEA Gramat, France

P 1 (5)  Design of Artificial Mains Network for Conducted Disturbance from 2 kHz to 30 MHz
Farhan Mahmood, Ken Okamoto, Hidetoshi Tatamichi, Kazuhito Takaya
NTT Network Technology laboratories, Japan

P 1 (6)  Using the ‘Test Wire’ Method as an Alternative to the CISPR 12 Full Vehicle Measurement Method
Max Paterson¹,², John Dawson¹
¹University of York, United Kingdom; ²Horiba MIRA Ltd

P 1 (7)  Evaluation of the Loading Effect on the Optically Modulated Scatterer
Andrzej E. Sowa¹, Robert Vogl-Ardatjew²
¹Wroclaw University of Technology, Poland; ²University of Twente, Netherlands

P 1 (8)  Thermal Imaging Aided Assessment of a State of Equipment Under Test and its Protecting Elements
Stanislaw Galla¹, Tomasz Lisewski², Agnieszka Mikołajczyk², Stanislaw Abramik²
¹Gdansk University of Technology, Faculty of Electronics, Telecommunications and Informatics, Poland; ²Electrotechnical Institute, Gdansk Branch, Poland

P 1 (9)  Comparison of Platform and Background Interference in View of Communication Performance
Karina Fors, Kia Wiklundh
Swedish Defence Research Agency, FOI, Sweden

Jolanta Karpowicz¹, Paweł Bienkowski², Jarosław Kieliszek³
¹Central Institute for Labour Protection - National Research Inst.(CIOP-PIB), Warszawa, Poland; ²Gdansk University of Technology, Wroclaw, Poland; ³Military Institute of Hygiene and Epidemiology, Warszawa, Poland

On authors’ request this paper will be presented in poster session P 2

P 1 (11) Prediction of Ringing Frequencies in DC-DC Boost Converters
Piotr Musznicki¹, Marcin Rucinski¹, Marek Turzynski¹, Stanislaw Abramik²
¹Gdansk University of Technology, Faculty of Electrical and Control Engineering, Poland; ²Electrotechnical Institute Gdansk Branch, Poland

P 1 (12) EMC Assessment of a Switching Mode Power Supply for Electromedical Devices
Andrea Lai, Ivan Luigi Spano, Ignazio Marongiu, Gianluca Gatto
University of Cagliari, Italy

P 1 (13) Voltage-Dependence Capacitance System Calculation of High-Voltage Trench-Gated IGBT
Guang-xiao Luo¹, Wei-dong Zhang¹, Lei Qi¹, Guo-liang Zhao²
¹North China Electric Power University, People’s Republic of China; ²State Grid Smart Grid
EMC EUROPE 2016 WROCLAW – Final Programme – Tuesday 6th September, 2016

Research Institute, People’s Republic of China

P 1 (14) **Time Domain Simulation for Multiconductor Transmission Line Model with Frequency Dependent Parameters**
Agnieszka Wardzińska
Poznan University of Technology, Poland

P 1 (15) **Statistical Analysis of Crosstalk Subject to Multiple Uncertainty Sources Using Stochastic Reduced Order Models**
ZHOUXIANG FEI, YI HUANG, JIAFENG ZHOU, QIAN XU
The University of Liverpool, United Kingdom

P 1 (16) **3D/2D Radiation Pattern Measurement of Different GSM Phones for EMC Applications**
Mohammed Adnan Salhi, Osman Şen, Soydan Çakır, Mustafa Çetintaş
TUBITAK UME, Turkey

P 1 (17) **Implementation a database of hardware interfaces for information devices in the identifying process based on radiated emissions**
Rafal Przesmycki, Marek Bugaj, Leszek Nowosielski, Marian Wnuk
Military University of Technology, Poland

P 1 (18) **Method for measuring of emission using half double loaded circular frame antenna located perpendicularly over a conductive plane**
Waldemar Eugeniusz Grzebyk
Wroclaw University of Science and Technology, Poland

**Meetings**

**MEETING 3**
IEEE EMC-S PL & EMC SECTION TECHNICAL MEETING
Chaired by: Grzegorz Maslowski, Rzeszow University of Technology, Poland
Room: E (C-13)

**MEETING 4**
IEEE REGION 8 CHAPTER RETREAT
Chaired by: Frank Leferink, University of Twente - THALES, the Netherlands
Room: F (C-13)

**Welcome coctail**
Time: 18:00 – 21:00
Main building A-1

Details – see page 5.
### Wednesday, 7th September 2016 – 2nd Symposium day

<table>
<thead>
<tr>
<th>ROOM TIME</th>
<th>ROOM</th>
<th>SESSION or BREAK</th>
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<tr>
<td>9:00</td>
<td>Room A</td>
<td>Chambers &amp; Cells (1)</td>
<td>Room B</td>
<td>Immunity tests (1)</td>
<td>Room C</td>
<td>Shielding</td>
<td>Room D</td>
<td>Industrial forum &amp; company presentations (1)</td>
<td>Room E</td>
<td>EMC Lab</td>
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<td>Chair: Frank Leferink</td>
<td>Chair: Ferran Silva, Universitat Politecnica Catalunya, Spain</td>
<td>Chair: Jan Carlsson, Provin, Sweden</td>
<td>Chairs: Tadeusz W. Więckowski, Tomasz Utkowski, Wrocław Univ. of Science and Technology, Poland</td>
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<td>10:30</td>
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<td>11:00</td>
<td>OS 6B (O_We_A2)</td>
<td>Chambers &amp; Cells (2)</td>
<td>OS 7B (O_We_B2)</td>
<td>Immunity tests (2)</td>
<td>OS 9 (O_We_C2)</td>
<td>Lightning</td>
<td>IF&amp;C 2</td>
<td>Industrial forum &amp; company presentations (2)</td>
<td>Chair: Andrzej E. Sowa, Wrocław Univ. of Science and Technology, Poland</td>
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<td>Chair: Valter Mariani Primiani, Università Politecnica delle Marche, Italy</td>
<td>Chair: Ferran Silva, Universitat Politecnica Catalunya, Spain</td>
<td>Chair: Grzegorz Maslowski, Rzeszów University of Technology, Poland</td>
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<td>Chair: Andrzej E. Sowa, Wrocław Univ. of Science and Technology, Poland</td>
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<td>12:30</td>
<td>Lunch</td>
<td>(Canteen, building C-18, Hoene-Wronskiego Str. 10)</td>
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<td>Meeting 5</td>
<td>IEEE TC7 Meeting</td>
<td>Chair: David Thomas, University of Nottingham, UK</td>
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<td>13:30</td>
<td>Exp</td>
<td>Experiments and demonstrations (13:30 – 15:30)</td>
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<td>Chair: Zbigniew Joskiewicz, Wrocław Univ. of Science and Technology, Poland</td>
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<td>14:00</td>
<td>OS 6C (O_We_A3)</td>
<td>Chambers &amp; Cells (3)</td>
<td>OS 10A (O_We_B3)</td>
<td>EMC in wireline &amp; wireless communication systems (1)</td>
<td>OS 11 (O_We_C3)</td>
<td>EMC in automotive systems</td>
<td>IF&amp;C 3</td>
<td>Industrial forum &amp; company presentations (3)</td>
<td>Chair: Andrzej E. Sowa, Wrocław Univ. of Science and Technology, Poland</td>
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<td>Chair: Marco Klingler, Peugeot Citroen Automobiles, France</td>
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<td>Chair: Andrzej E. Sowa, Wrocław Univ. of Science and Technology, Poland</td>
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<td>16:00</td>
<td>OS 12 (O_We_A4)</td>
<td>Electromagnetic Interferences</td>
<td>OS 10B (O_We_B4)</td>
<td>EMC in wireline &amp; wireless communication systems (2)</td>
<td>OS 13 (O_We_C4)</td>
<td>IEMI, HPM &amp; NEMP</td>
<td>IF&amp;C 4</td>
<td>Industrial forum &amp; company presentations (4)</td>
<td>Chair: Andrzej E. Sowa, Wrocław Univ. of Science and Technology, Poland</td>
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<td>Chair: Heyno Garbe, Leibniz Universität Hannover, Germany</td>
<td>Chair: Ryszard J. Zieliński, Wrocław Univ. of Science and Technology, Poland</td>
<td>Chair: Jan Luiken ter Haseborg, Hamburg University of Technology, Germany</td>
<td>Chair: Frank Sabath, WIS, Germany</td>
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<td>20:00 – 23:00</td>
<td>Symposium Banquet</td>
<td>(DoubleTree by Hilton Wrocław)</td>
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**Oral sessions**

**OS 6A (O_We_A1) ORAL SESSION**

**CHAMBERS & CELLS (1)**

Chaired by: Frank Leferink, University of Twente - THALES, NL  
Room: A (C-13)

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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<tbody>
<tr>
<td>9:00</td>
<td>Optimization Techniques for Source Stirred Reverberation Chambers</td>
<td>Alfredo De Leo, Valter Mariani Primiani, Paola Russo, Graziano Cerri</td>
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<td>Università Politecnica delle Marche, Ancona, Italy</td>
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<tr>
<td>9:22</td>
<td>Validating Reverberation Chamber Performance Based on Assessment of</td>
<td>Luk R. Arnaut1, Ramiro Serra2, Philip D. West3</td>
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<tr>
<td></td>
<td>Field Anisotropy</td>
<td>1School of Electronic Engineering and Computer Science, Queen Mary</td>
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<td>University, London, United Kingdom; 2Eindhoven University of Technology,</td>
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<td>The Netherlands; 3Centre for Electromagnetics and Time Metrology,</td>
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<td></td>
<td>National Physical Laboratory, Teddington TW11 0LW, United Kingdom.</td>
</tr>
<tr>
<td>9:45</td>
<td>Effect of Loss Distribution on Uncorrelated Spatial Points and</td>
<td>Luca Bastianelli, Valter Mariani Primiani, Franco Moglie</td>
</tr>
<tr>
<td></td>
<td>Frequency Steps in Reverberation Chambers</td>
<td>Università Politecnica delle Marche, DII, Ancona, Italy</td>
</tr>
<tr>
<td>10:07</td>
<td>Analytical Model of a Mechanically Stirred Reverberation Chamber</td>
<td>Guillaume Andrieu, Ayoub Soltane, Alain Reineix</td>
</tr>
<tr>
<td></td>
<td>Based on EM Field Modal Expansion</td>
<td>XLIM Laboratory - University of Limoges, France</td>
</tr>
</tbody>
</table>

**OS 7A (O_We_B1) ORAL SESSION**

**IMMUNITY TESTS (1)**

Chaired by: Ferran Silva, Universitat Politecnica Catalunya, Spain  
Room: B (C-13)

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00</td>
<td>An ESD Test Approach for Spacecraft Applications</td>
<td>Emiliano Scione1, Vincenzo Iacovone1, Edmondo Scorzafava2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thales Alenia Space Italia s.p.a, Italy; 2Italian Space Agency (ASI) Rome</td>
</tr>
<tr>
<td>9:22</td>
<td>Proficiency Testing for Conducted Immunity with a new Round Robin Test</td>
<td>Emrah Tas1, Soydan Cakir2, Mustafa Çetintas2, Pavel Hamouz3, Thomas Isbring3, Miha Kokaž4, Daniel Lopez5, Urban Lundgren6, Dwi Mandaris7,11, Borut Pinter5, Mar in Poriz3, Marc Pous3, Frederic Pythoud7, Osman Sen8, Ferran Silva9, Marek Svoboda3, Braise Trincaz5, Dongsheng Zhao10</td>
</tr>
<tr>
<td></td>
<td>Device</td>
<td>1Swiss Federal Institute of Metrology METAS, Switzerland; 2TÜBİTAK UME, Turkey; 3Czech Metrology Institute, Czech Republic; 4SP Technical Research Institute of Sweden, Sweden; 5Slovenian Institute of Quality and Metrology, Slovenia; 6National Institute of Aerospace Technology (INTA), Spain; 7University of Twente, the Netherlands; 8Universitat Politècnica de Catalunya, Spain; 9National Laboratory of Metrology and Test, France; 10Dutch Metrology Institute VSL, the Netherlands; 11Indonesian Institute of Sciences, LIPI, Indonesia</td>
</tr>
<tr>
<td>9:45</td>
<td>Alternative Coupling Method for Immunity Testing of Power Grid Protection Equipment</td>
<td>Christian Suttner1, Stefan Tenbohlen2, Werner Ebbinghaus2</td>
</tr>
<tr>
<td></td>
<td>Equipment</td>
<td>1University of Stuttgart, Germany; 2ABB AG – PPMV-E</td>
</tr>
</tbody>
</table>
OS 8 (O_We_C1)  ORAL SESSION

9:00 - 10:30

Shielding

Chaired by: Jan Carlsson, Provinn, Sweden

Room: C (C-13)

9:00  Measurement of the Electric Transient Shielding Effectiveness of a Cubic Resonator in Time and Frequency Domain
Stefan Parr¹, Stefan Dickmann¹, Martin Schaarschmidt²
¹Helmut-Schmidt-University Hamburg, Germany; ²Bundeswehr Research Institute for Protective Technologies and NBC Protection Munster, Germany

9:22  A network of Ports to Estimate Shielding Effectiveness of an Enclosure with Apertures
Ali Shourvarzi, Mojtaba Joodaki
Ferdowsi University of Mashhad, Islamic Republic of Iran

9:45  Fast Shielding Effectiveness Prediction for Multiple Cascaded Enlosures with Apertures Based on Electromagnetic Topology
Liping Yan¹, Yong Kan¹, Xiang Zhao¹, Haijing Zhou²
¹Sichuan University, People’s Republic of China; ²Institute of Applied Physics and Computational Mathematics, People’s Republic of China

10:07  Predicting Shielding Effectiveness of Populated Enclosures Using Absorption Cross Section of PCBs
Sarah L. Parker¹, Ian D. Flintoft ¹, Andy C. Marvin ¹, John F. Dawson¹, Simon J. Bale¹, Martin P. Robinson¹, Ming Ye², Changyong Wan³, Mengze Zhang³
¹University of York, United Kingdom; ²Huawei Technologies AB, Kista, Sweden; ³Huawei Technologies Co. Ltd, Shenzhen, People’s Republic of China

OS 6B (O_We_A2)  ORAL SESSION

11:00 - 12:30

Chambers & Cells (2)

Chaired by: Valter Mariani Primiani, Università Politecnica delle Marche, Italy

Room: A (C-13)

11:00  Measurement of the Stochastic Electromagnetic Field Coupling to Transmission Line Networks of Single-Wire Lines Above a Ground Plane
Johanna Kasper, Mathias Magdowski, Ralf Vick
Otto von Guericke University Magdeburg, Germany

11:22  Experimental Validation of the Stability for Statistical Electromagnetic Characteristics inside Electrically Large Enclosure with Aperture
Yuan Zhao¹, Xiang Zhao¹, Liping Yan¹, Haijing Zhou², Kama Huang¹
¹The School of Electronics and Information, Sichuan University; ²Beijing Institute of Applied Physics and Computational Mathematics

11:45  Measurement of the Coupling to Shielded Cables Above a Ground Plane in a Reverberation Chamber
Mathias Magdowski, Buddhi Ram Banjade, Ralf Vick
Otto von Guericke University, Germany
### Experimental Analysis for Metamaterials Used to Lower the LUF of a Reverberation Chamber

**Dominique LEMAIRE**¹, Luis Felipe WANDERLINDER³, Divitha SEETHARAMDOO²

¹AIRBUS, France; ²IFSTTAR, FRANCE

### OS 7B (O_We_B2) ORAL SESSION

**IMMUNITY TESTS (2)**

**Chaired by:** Ferran Silva, Universitat Politecnica Catalunya, Spain

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speakers</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00</td>
<td>Immunity of a Pacemaker with a Wireless Power Transfer Coil</td>
<td>Tommaso Campi, Silvano Cruciani, Valerio De Santis, Mauro Feliziani</td>
<td>University of L’Aquila, Italy</td>
</tr>
<tr>
<td>11:22</td>
<td>EMC Analysis of the Pacing Activity of an Implantable Cardiac Medical Device</td>
<td>Andrea Lai, Ivan Luigi Spano, Ignazio Marongiu, Alessandro Serpi</td>
<td>University of Cagliari, Italy</td>
</tr>
<tr>
<td>11:45</td>
<td>EMC Susceptibility Characterization of an Operational Amplifier-Based Circuit Combining Different Technique</td>
<td>Maxime Girard¹², Tristan Dubois¹, Genevieve Duchamp¹, Patrick Hoffmann²</td>
<td>Univ. Bordeaux, France;²CEA - Centre de Gramat, France</td>
</tr>
<tr>
<td>12:07</td>
<td>On the Use of the IC Stripline to Evaluate the Susceptibility to EMI of Small Integrated Circuits</td>
<td>Franco Fiori, Michele Perot i</td>
<td>Politecnico di Torino, Italy</td>
</tr>
</tbody>
</table>

### OS 9 (O_We_C2) ORAL SESSION

**LIGHTNING**

**Chaired by:** Grzegorz Masłowski, Rzeszow University of Technology, Poland

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speakers</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00</td>
<td>Distribution of Long Duration Current Impulses in a Test House Lightning Protection System and Electrical Equipment</td>
<td>Grzegorz Masłowski, Stanisław Wyderka, Lesław Karpinski, Robert Ziembia, Grzegorz Karnas, Kamil Filik, Paweł Szczupak</td>
<td>Rzeszow University of Technology, Poland</td>
</tr>
<tr>
<td>11:22</td>
<td>Test set-up to examine electronic circuits’ immunity to nearby flash</td>
<td>Lesław Karpinski¹, Krzysztof Wojtasiewicz², Dariusz Gibalski², Paweł Karpinski³</td>
<td>¹Rzeszow University of Technology, Poland;²Military Institute of Armament Technology, Poland;³TELAB sp. z o. o, Poland</td>
</tr>
<tr>
<td>11:45</td>
<td>Analysis of Features of Selected Models for Simulation of Lightning Threat</td>
<td>Karol Aniserowicz</td>
<td>Politechnika Bialostocka, Poland</td>
</tr>
<tr>
<td>12:07</td>
<td>A Reciprocity Approach to the Indirect Effects of Lightning Impact on an Aircraft Engine</td>
<td>Paula Aguilera¹, Cyril Lair¹, Bastiaan Michielsen², François Issac²</td>
<td>¹SNECMA, Villaroche, France;²ONERA, The French Aerospace Lab, Toulouse, France</td>
</tr>
</tbody>
</table>
### OS 6C  
**CHAMBERS & CELLS (3)**  
**Time:** 14:00 - 15:30  
**Room:** A (C-13)  

**Chair:** Heyno Garbe, Leibniz Universität Hannover, Germany  

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:00</td>
<td>Investigation of the performance of the GTEM 1750 from 0.08 GHz to 6 GHz.</td>
<td>Arthur Vie, Benjamin Guy Loader, Daniel Bownds NPL, United Kingdom</td>
</tr>
<tr>
<td>14:22</td>
<td>GTEM cell as an Alternative Method for Radiated Immunity Tests A comparison with an Anechoic Chamber</td>
<td>Mohammed Adnan Salhi, Soydan Çakır, Mehmet Çınar, Bahadir Tektaş, Mustafa Çetintas TUBITAK UME, Turkey</td>
</tr>
<tr>
<td>14:45</td>
<td>Measurements with a 3D-D-Dot-Sensor in Reverberation Chambers</td>
<td>Mar in Aidam, Tobias Zorn Daimler AG, Germany</td>
</tr>
</tbody>
</table>

### OS 10A  
**EMC IN WIRELINE & WIRELESS COMMUNICATION SYSTEMS (1)**  
**Time:** 14:00 - 15:30  
**Room:** B (C-13)  

**Chair:** Ryszard J. Zielinski, Wroclaw University of Science and Technology, Poland  

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:00</td>
<td>Determination of the Radiated Power of Radio Station Through Field Strength Measurement Along a Route</td>
<td>Georgij Efimovich Leontjev Communications Regulatory Authority of the Republic of Lithuania, Lithuania</td>
</tr>
</tbody>
</table>
| 14:22 | Measurement of Radiated Spurious Emissions with the Substitution and Field Strength Test Methods | Bruno Audone¹, Roberto Colombo²  
¹EMC Consultant, Italy; ²IMQ EMC Lab manager |
| 14:45 | Automatic measurement of electromagnetic interference environment | Patrik Eliardsson, Karina Fors, Kia C. Wiklundh, Björn Gabrielsson, Mikael Alexandersson, Johan Hedström Swedish Defence Research Agency, Sweden |
| 15:07 | Time-Frequency Diversity for Solving the Deadlock in Defining Interference Levels in Power Lines | Iwan Seiawan¹,³, Frank Leferink¹,², Frits Buesink¹  
¹University of Twente; ²THALES; ³Indonesian Institute of Sciences |
### OS 11 (O_We_C3)

**EMC IN AUTOMOTIVE SYSTEMS**  
**Chaired by:** Marco Klingler, Peugeot Citroen Automobiles, France  
**Room:** C (C-13)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Authors</th>
</tr>
</thead>
</table>
| 14:00| Noise Suppression Method for an AM radio Receiver Using Digital Signal Processing                       | Yoshiyuki Hattori¹, Tomohisa Harada¹, Shinya Ito², Mitsuji Fujimoto², Toshikazu Hon²  
TOYOTA CENTRAL R&D LABS., INC., Japan; ²UNIVERSITY OF FUKUI, Japan |
| 14:20| Miniaturization of electric vehicle fast chargers with respect to EMC standards                        | Andrzej Tadeusz Uramek¹, Marcin Adam Pietrzycki¹, Aleksander Polit¹, Jim van-der-Heijden², Stefan Joannes Raaijmakers²  
¹ABB Corporate Research Center, Kraków, Poland; ²ABB BV, Eindhoven, The Netherlands |
| 14:40| Common-mode Current Analysis Focused on Grounding Structures of Shielded Cable and Power Converter Chassis | Yoshihiro Kida¹, Tatsuya Ozawa¹, Shinji Ohoka¹, Yasuhiro Fukagawa¹, Kaoru Torii²  
¹NIPPON SOKEN, INC, Japan; ²TOYOTA MOTOR CORPORATION, Japan |
| 15:00| Characterization of Current Transformers for Impedance Measurements in Automotive Immunity Test Setups  | Seyyed Ali Hassanpour Razavi, Stephan Frei  
TU Dortmund, Germany |
| 15:20| Software Based Control of the EMI Generated in BLDC Motor Drives                                       | Michele Perotti, Franco Fiori  
Politecnico di Torino, Italy |

### OS 12 (O_We_A3)

**ELECTROMAGNETIC INTERFERENCIES**  
**Chaired by:** Heyno Garbe, Leibniz Universitaet Hannover, Germany  
**Room:** A (C-13)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Authors</th>
</tr>
</thead>
</table>
| 16:00| Development of an EMC demonstration unit                                                               | Andy Degraeve¹, Keith Armstrong², Tim Claeyς¹, Filip Vanhee¹, Joan Peuteman¹, Davy Pisssoort¹  
¹KU Leuven, Belgium; ²Cherry Clough Consultants Ltd |
| 16:22| EMI Performance of Power Delivery Networks in 3D TSV Integration                                        | Yuuki Araga¹, Makoto Nagata², Hiroaki Ikeda², Katsuya Kikuchi¹, Noriyuki Miura²  
¹National Institute of Advanced Industrial Science and Technology (AIST), Japan; ²Kobe Uni-  
versity |
| 16:45| Analysis of Conducted Emissions from an Electric Nacelle Anti-Ice Power Control System                 | Angela Nothofer, Steve Greedy, Luca Tarisciotti  
University of Nottingham, United Kingdom |
| 17:07| Characteristic Evaluation of Conducted Disturbance Measuring Apparatus Using Two Parallel TEM cells     | Ryosuke Tani¹², Ifong Wu², Shinobu Ishigami², Yasushi Matsumoto², Ryosuke Suga¹, Osamu Hashimoto¹  
¹Aoyama Gakuin University, Japan; ²National Institute of Information and Communications Technol  
ogy |
### ORAL SESSION

**EMC IN WIRELINE & WIRELESS COMMUNICATION SYSTEMS (2)**

**Chair by:** Ryszard J. Zielinski, Wroclaw University of Science and Technology, Poland  
**Room:** B (C-13)  
**Time:** 16:00 - 17:30

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
<th>Institution(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16:00</td>
<td>Approximations of BEP for Multiple Impulse Noise Sources</td>
<td>Sara Örn Tengstrand, Erik Axell, Patrik Eliardsson</td>
<td>Swedish Defence Research Agency, Sweden</td>
</tr>
<tr>
<td>16:22</td>
<td>Performance of Frequency Hopping Systems with Adjacent Channel Interference</td>
<td>Sara Linder1, Kia Wiklundh1, Leif Junholm2</td>
<td>1Swedish Defence Research Agency (FOI), Sweden; 2Swedish Defence Material Administration (FMV)</td>
</tr>
<tr>
<td>16:45</td>
<td>EMI Susceptibility of High Speed Differential Wireline Communication Front-ends</td>
<td>Gilbert Andrew Matig-a, Dr. Mehmet Yuce, Dr. Jean-Michel Redoute</td>
<td>Monash University, Australia</td>
</tr>
<tr>
<td>17:07</td>
<td>Simulation of DVOR Carrier Wave Propagation Over Real Terrain</td>
<td>Sergei Sandmann, Heyno Garbe</td>
<td>Institute of Electrical Engineering and Measurement Technology, Leibniz University Hannover, Germany</td>
</tr>
</tbody>
</table>

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### ORAL SESSION

**IEMI, HPM & NEMP**

**Chair by:** Jan Luiken ter Haseborg, Hamburg University of Technology, Germany  
**Room:** C (C-13)  
**Time:** 16:00 - 17:30

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
<th>Institution(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16:00</td>
<td>Electro-Thermo-Stress Analysis of AlGaN/GaN HEMTs Breakdown Caused by HPM Pulses</td>
<td>Zheng-wei San1, Liang Zhou1, Wen-Yan Yin2</td>
<td>1Shanghai Jiao Tong University, People’s Republic of China; 2Zhejiang University</td>
</tr>
<tr>
<td>16:22</td>
<td>Leakage Electric Field Analysis of a Guided Wave NEMP Simulator</td>
<td>Rakesh Kichouliya, Subrahmanyam Boyapati</td>
<td>Research centre Imarat, India</td>
</tr>
<tr>
<td>16:45</td>
<td>Protection Strategy against IEMI for Wireless Communication Infrastructures</td>
<td>Stefan van de Beek1, Mirjana Stojilović2, Nicolas Mora3, Marcos Rubinstein2, Farhad Rachidi-Haeri3, Frank Leferink14</td>
<td>1University of Twente, Enschede, Netherlands; 2University of Applied Sciences and Arts Western Switzerland, Yverdon-les-Bains, Switzerland; 3Swiss Federal Institute of Technology (EPFL), Lausanne, Switzerland; 4Thales Nederland B.V., Hengelo, Netherlands</td>
</tr>
<tr>
<td>17:07</td>
<td>Measurements Conducted 2014-2016 – Results and Lessons Learned</td>
<td>Per Ångskog1,2, Mats Bäckström2,3, Bengt Vallhagen3, Carl Samuelsson3</td>
<td>1KTH - Royal Institute of Technology, Sweden; 2University of Gävle; 3Saab Aeronautics</td>
</tr>
</tbody>
</table>
**Experiments and demonstrations**

<table>
<thead>
<tr>
<th>Exp</th>
<th>EXPERIMENTS AND DEMONSTRATIONS</th>
<th>Time: 13:30 - 15:30</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>EXPERIMENTS AND DEMONSTRATIONS</strong></td>
<td></td>
</tr>
<tr>
<td>Chaired by:</td>
<td>Zbigniew Jóskiewicz, Wroclaw University of Science and Technology, Poland</td>
<td>Building C-15</td>
</tr>
</tbody>
</table>

**Experiment 1** "Remote practical works on transmission lines in the L3-EOLES Bachelor degree"

Presenter: Guillaume Andrieu, Assistant Professor, XLIM laboratory, University of Limoges, France

Abstract:
This proposal aims to do a live demonstration of remote practical works (available from any Internet connection) build in the framework of a third year Bachelor degree fully online launched at the University of Limoges in 2014.

Two practical works ("Time-domain study of a RG58 cable", "Dispersion analysis of a LC delay line") about transmission lines will be showed.

**Experiment 2** "Innovative solution in Power Integrity & Signal Integrity Electromagnetic Analysis for PCB"

Presenter: Dr. Andrzej Ciminski, AM Technologies, Poland

Abstract:
It has become much more important to get higher frequency s-parameters for PCB accurately due to ever increasing data rates. ADS 2016 features a host of new technologies designed to improve accuracy of PCB simulations, including two electromagnetic (EM) software solutions specifically created to help signal and power integrity engineers.

This solution consists in 4 new EM simulators:
- DC IR drop analysis
- AC PDN impedance analysis
- Power plane resonance analysis
- Power-aware signal integrity analysis.

In his presentation, you will learn the new innovative pure EM based SIPro and PIPro composite technologies for designing high speed digital boards. SIPro and PIPro provides a cohesive workflow with ADS for signal integrity and power integrity applications.

**Experiment 3** "Radiated emissions of cables through shielded enclosure seams and effect of time rise/fall on clock signals"

Presenter: Ismael Molina Alba, Product Manager EMC inductors, EMC & Inductive Solutions, Würth Elektronik eiSos GmbH. & Co. KG

Abstract:
This experiment shows a means of measuring leakage of electromagnetic energy through seams of a shielded enclosure to analyse the effects in some test positions around the cover. This cover will be removable and will have 18 threaded fasteners distributed around its periphery.

An oscillator circuit capable of producing a typical periodic clock signal will be put inside the shielded enclosure. The output of the oscillator will be connected to a long twin lead to generate common-mode currents and to investigate their associated radiated emissions.

Next, to study the emissions, a probe will be placed in each defined test positions to measure the potential difference between the cover and the enclosure. Then, it will be used a ferrite common-mode chokes to suppress the common-mode current. Another solution to reduce the common-mode effects is to connect a filter adapter to the long twin lead. Nevertheless, his two methods will increase the rise/fall time of the signal.

Therefore, the final solution could be to use a gasket to shield the seams of the cover and to achieve emissions reduction as using a ferrite common-mode chokes or a filter adapter, but his method does not increase rise/fall times of the generated clock signal.

(These experiments are based in the ESAC’s EMC Experiments Manual).
Experiment 4  "DC/DC Converter Measurements and EMC Simulation of Conducted Emission"
Presenter: Jan Eichler, Marcel Plonka, CST
Abstract:
DC/DC converters are common source of conducted emissions. In CST experiment a real
Step-down Buck Converter will be presented as an object for both the measurements and
3D-EM simulations.
CST STUDIO SUITE will be use to present the complete simulation workflow including:
1. Layout import - materials, ports,lumped elements
2. 3D-EM setup - 3D geometry, simulation set ings (boundary conditions, mesh)
3. Circuit setup - nonlinear components, components to be tuned
The comparison of simulation results with measurement results will be presented. Effects of
applying EMI filter and possible layout differences will be discussed as well.

Experiment 5  "An EMField Generator - an Integrated Novel Solution for Radiated Immunity Testing,
including IEC 61000-4-3"
Presenter: Lukasz Wilk, ETS-Lindgren (EMEA)
Abstract:
In this “live” demonstration in an EMC chamber, attendees will see a novel EMField genera­
tor used for an IEC 61000-4-3 fully compliant RF immunity test in the 1 - 6 GHz frequency
range at a test level of 3V/m, with 80% AM modula ion.
The compact test set up will be reviewed prior to he live demonstration. A comparison will be
shown between this novel solution and the traditional approach. The advantages in the sim­
ples, novel solution will be contrasted to the complex, tradi ional approach to this test that re­
quires larger amplifiers at a greater expense to compensate for the reflected power loss from
the load. Power efficiencies wi h minimal signal loss will be shown in the novel solution.
Attendees will see how the compact novelsolution can be used as a full replacement to the
complex traditional set up for testing in accordance with IEC 61000-4-3.

Industrial forum and company presentations

IF&CP 1  ORAL SESSION  Time:  9:00 - 10:30
INDUSTRIAL FORUM & COMPANY PRESENTATIONS (1)
Chaired by: Tadeusz W. Więckowski, Tomasz Utkowski
Wrocław University of Science and Technology, Poland
Room:  D (C-13)

9:00 - 9:30  A high power aircraft test facility we have recently installed.
AR Europe / UEI

9:30 - 10:30  Harmonic and flicker measurement, tests repeatability and new stand­
ards in IEC TR 61000-4-37 &-38
AMETEK CTS - Markus Furer
IF&CP 2  ORAL SESSION  Time: 11:00 - 12:30

INDUSTRIAL FORUM & COMPANY PRESENTATIONS (2)
Chaired by: Andrzej E. Sowa, Wroclaw University of Science and Technology, Poland  Room: D (C-13)

11:00 - 11:20 Altair Engineering GmbH
11:20 - 11:40 ASTAT Sp. z o.o.
11:40 - 12:00 ATDI Advanced Radiocommunications
12:00 - 12:20 CST - Computer Simulation Technology AG

IF&CP 3  ORAL SESSION  Time: 16:00 - 17:30

INDUSTRIAL FORUM & COMPANY PRESENTATIONS (3)
Chaired by: Andrzej E. Sowa, Wroclaw University of Science and Technology, Poland  Room: D (C-13)

16:00 - 16:20 EMI Solutions PVT.LTD
16:20 - 16:40 ETS Lindgren
16:40 - 17:00 Frankonia
17:00 - 17:20 Helmar Jacek A. Dobrowiecki
17:20 - 17:40 Microwave Vision Group (MVG)

Meeting

MEETING 5  Time: 12:30 - 14:00

Meeting 5: IEEE TC7 Meeting
Chaired by: David Thomas, The University of Nottingham, United Kingdom  Room: E (C-13)

Symposium Banquet

Time: 20:00 - 23:00

DoubleTree by Hilton Wroclaw

Details – see page 5.
Thursday 8th September 2016 – 3rd Symposium day

<table>
<thead>
<tr>
<th>TIME</th>
<th>SESSION or BREAK</th>
</tr>
</thead>
</table>
| 9:00 | Keynote 2  
Chair: Grzegorz Maslowski  
Rzeszow University of Technology, Poland |
| 9:50 | Coffee break  
(confERENCE building C-13, hall) |
| 10:30 | MEETING 8  
EU Project Initiators’ Meeting  
(9:50 – 12:30)  
Chair: Davy Pissoort  
KU Leuven, Belgium |
| 12:30 | Lunch  
(Canteen, building C-18, Hoene-Wronskiego Str. 10) |
| 13:30 | MEETING 6  
EMC Europe ISC Meeting  
(15:30 – 18:00)  
Chairs: Andy Marvin  
University of York, York EMC Services, United Kingdom  
Jan Carlsson  
Provin, Sweden |
| 14:00 | Workshop 8B  
Frequency Policy and Spectrum Engineering:  
"700 MHz spectrum and networks reframing"  
Organizer / Chair: Dariusz Więcek  
National Institute of Telecommunications, Poland |
| 15:30 | Workshop 8C  
Frequency Policy and Spectrum Engineering:  
"Software tools for spectrum engineering"  
Organizer / Chair: Dariusz Więcek  
National Institute of Telecommunications, Poland |
| 18:00 | International Steering Committee Dinner  
(building H-14) |
"Trends in Spectrum Sharing for Future Wireless Networks"

Luiz Da Silva,
Trinity College Dublin, Ireland

Abstract:

The traditional model of exclusive use of spectrum is increasingly being challenged, both in civilian and military systems. One recent example is the radar bands, which are being considered for sharing by small cells in commercial wireless systems. Sharing of spectrum can also be coupled with sharing of wireless access infrastructure. In this presentation, we will discuss solutions for enabling spectrum sharing in future systems, as well as performance tradeoffs in spectrum and radio access infrastructure sharing.

**Workshops**

**WS 8**

**WORKSHOP 8**

**FREQUENCY POLICY AND SPECTRUM ENGINEERING**

Organized by: Dariusz Więcek
National Institute of Telecommunications, Poland

WS 8A
(10:30 - 12:30)
Lunch
WS 8B
(14:00 - 15:30)
Coffee break
WS 8C
(16:00 - 17:30)

**Speakers:**
Walid Sami (EBU), Daniel Gueorguiev (GSMA Mobile for Development Foundation), Péter Vári (National Media and Infocommunications Authority of Hungary), Andrew Stirling (Larkhill Consultancy), Pavel Dvořák (Ministry of Industry and Trade of the Czech Republic), Ronald Lorenz (Media Broadcast), Halina Uryga (Orange), Peter Faris (ECO), Istvan Bozsoki (ITU), Dariusz Wypiór & Dariusz Więcek (National Institute of Telecommunications)

Sessions:

**Abstract:**

The current technology progress has a big influence on society behaviour and experiences, new technology are rapidly growing. Such situation requires adaption of new technology both on transmission and reception sites and new frequency policy paradigm shifts. The aim of the workshop is presenting, discussing and proposing solutions for future broadcasting and mobile networks, audio and video content delivering as well as highlight potential of future spectrum policy and engineering potential. In this context the motto is „Perspectives of Terrestrial Broadcasting and Mobile Networks”. The workshop is organized within project Frequency Policy and Spectrum Engineering in V4 countries supported by Visegrad Fund.

More information about this workshop is available on: [http://www.fpse2016.nit.eu/](http://www.fpse2016.nit.eu/)
Programme:

**WS 8A session**

"UHF spectrum – Mobile and/or Broadcasting?"

Chair: Dariusz Więcek  
**Time: 10:30 - 12:30**

**Opening**

**UHF spectrum, an essential resource for broadcasting**

Walid Sami  
European Broadcasting Union

**The Socio-Economic Benefits of the Digital Dividend**

Daniel Gueorguiev  
GSMA Mobile for Development Foundation

**Present and possible future of the PPDR in the UHF band in Hungary**

Péter Vári  
National Media and Infocommunications Authority of Hungary

**Developments in spectrum sharing technology – and applications to rural broadband and IoT**

Andrew Stirling  
Larkhill Consultancy

**WS 8B session**

"700 MHz spectrum and networks reframing"

Chair: Juraj Oravec  
**Time: 14:00 - 15:30**

**Strategy of Terrestrial DTV Evolution in Czech Republic**

Pavel Dvořák  
Ministry of Industry and Trade of the Czech Republic

**Migration to DVB-T2 in Germany and release of the 700 MHz Band**

Ronald Lorenz  
Media Broadcast

**Mobile Broadband in 700 MHz band**

Halina Uryga  
Spectrum Office of the Orange’s Group

**WS 8C session**

"Software tools for spectrum engineering"

Chair: Péter Nagy  
**Time: 16:00 - 17:30**

**New functionalities introduced in SEAMCAT 5 for sharing and compatibility studies**

Peter Faris  
European Communication Office

**ITU-BR and ITU-BDT software tools**

Istvan Bozsoki  
Spectrum Management and Broadcasting Division International Telecommunication Union

**NIT Software Tools for Frequency Planning and Spectrum Management**

Dariusz Wypiór, Dariusz Więcek  
Spectrum Engineering and Management Group, National Institute of Telecommunications
### Oral sessions

#### SS 1 (O_Th_B1) SPECIAL SESSION

**EMC DIAGNOSTICS OF COMPLEX SYSTEMS**

Chaired by: Vladimir Mordachev, Belarusian State University of Informatics and Radioelectronics (BSUIR), Belarus

<table>
<thead>
<tr>
<th>Time</th>
<th>Sessions</th>
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<tbody>
<tr>
<td>10:30</td>
<td>Electromagnetic Background Created by Base and Mobile Radio Equipment of Cellular Communications</td>
</tr>
<tr>
<td>10:50</td>
<td>Required Levels of Radiation Power of GSM Base Stations in Urban Area Taking Into Account Attenuation in Buildings and Intrasystem EMC</td>
</tr>
<tr>
<td>11:10</td>
<td>Computationally-Effective Worst-Case Model of Coupling between On-Board Antennas That Takes into Account Diffraction by Conducting Hull</td>
</tr>
<tr>
<td>11:30</td>
<td>EMC Diagnostics of Complex Radio Systems by the Use of Analytical and Numerical Worst-Case Models for Spurious Couplings Between Antennas</td>
</tr>
<tr>
<td>11:50</td>
<td>System-Level Model for Analysis of Dipole Antenna Response to Electromagnetic Pulse</td>
</tr>
<tr>
<td>12:10</td>
<td>Computationally Effective Wideband Combined Worst-Case Model of Monopole Antenna Coupling</td>
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#### OS 14 (O_Th_C1) ORAL SESSION

**HUMAN EXPOSURE TO EM FIELDS**

Chaired by: Mauro Feliziani, University of L’Aquila, Italy

<table>
<thead>
<tr>
<th>Time</th>
<th>Sessions</th>
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</thead>
<tbody>
<tr>
<td>10:30</td>
<td>Human Radio Frequency Exposure Limits: an update of reference levels in Europe, USA, Canada, China, Japan and Korea</td>
</tr>
<tr>
<td>10:50</td>
<td>Human Exposure Study for Large Scale Scenarios</td>
</tr>
</tbody>
</table>
11:10  **Evolution of the Exposure Level in Poland**  
Fryderyk Lewicki, Andrzej Lugowski, Grzegorz Zagorda  
Orange Polska, Poland

11:30  **Broadband Environment Mapping Using Modern Time-Domain Receivers for Exposure Assessment and Location Fingerprinting**  
Matthias Hampe¹, Olaf Berndt²  
¹Ostfalia University of Applied Science; ²WaveTec Engineering

11:50  **Simulation of Human Exposure to Electromagnetic Fields of Inductive Wireless Power Transfer Systems in the Frequency Range from 1 Hz to 30 MHz**  
Ekaterina Yavolovskaya¹,², Giorgi Chiqovani¹, Giga Gabriaze¹,², Sophia Iosava¹, Lily Svandze¹,², Benjamin Willmann³,⁴, Roman Jobava¹,²  
¹EMCoS Ltd., Tbilisi, Georgia; ²Tbilisi State University, Tbilisi, Georgia; ³VOLKSWAGEN AG, Wolfsburg, Germany; ⁴University of Magdeburg, Magdeburg, Germany

12:10  **Zero Phase Shift Digital Filtering for Assessment of Exposure to Non-Sinusoidal Magnetic Fields**  
Agnieszka Mikolajczyk¹, Tomasz Lisewski¹, Stanislaw Abramik¹, Marcin Racinski²  
¹Electrotechnical Institute Gdansk Branch 1 Narwicka st, 80-557 Gdansk; ²Gdansk University of Technology Faculty of Electrical and Control Engineering 11/12 G.Narutowicza st, 80-233 Gdansk

**OS 15 (O_Th_B2) ORAL SESSION**  
**Time:** 14:00 - 15:30  
**Room:** B (C-13)  
**Chair:** Frank Leferink, University of Twente - THALES, the Netherlands

14:00  **A Single Antenna Ambient Noise Cancellation Method for In-Situ Radiated EMI Measurements in the Time-Domain**  
Marco A. Azpúrua, Marc Pous, Ferran Silva  
Universitat Politècnica de Catalunya, Spain

14:22  **Comparison of Active Levelling and Pre-Calibrating/Substitution Method for Radiated Immunity Testing of Large Equipment**  
Dwi Mandaris¹,⁵, Soydan Cakir², Osman Sen², Daniel Lopez Sanz³, Maria Jimenez Lorenzo³, Frank Leferink¹,⁴, Marek Svoboda⁶, Pavel Hamouz⁶  
¹University of Twente, Enschede, The Netherlands; ²Electromagnetic Laboratory, TUBITAK UME, Kocaeli/Turkey; ³EMC Laboratory INTA, Madrid, Spain; ⁴Thales Netherland, Hengelo, The Ne herlands; ⁵Research Center for quality System and Testing Technology - LIPI, Serpong, Indonesia; ⁶Czech Metrology Institute, Electromagnetic Compatinbility Laboratory, Brno, Czech Republic

14:45  **Benefits of Full Time-Domain EMI Measurements for Large Fixed Installation**  
Marc Pous, Marco Azpúrua, Ferran Silva  
Grup de Compatibilitat Electromagnètica (GCEM), Universitat Politécnica de Catalunya (UPC)

15:07  **On Determining the Directivity of Electrically Large, Unintentional Electromagnetic Radiators - Assessment of a Real Electronic Equipment**  
Benjamin Menssen, Henrik Brech, Heyno Garbe  
Leibniz Universität Hannover, Germany
OS 16 (O_Th_C2)  
**ORAL SESSION**

**EMC ANALYSIS, MODELLING, PREDICTION FOR IC**  
Chair: Davy Pissoort, KU Leuven, Belgium  
Room: C (C-13)

**Time:** 14:00 - 15:30

14:00  
**Multiport ICIM-CI Modeling Approach Applied to a Bandgap Voltage Reference**  
Siham Hairoud Airieau\(^1,2\), Tristan Dubois\(^1\), Geneviève Duchamp\(^1\), André Durier\(^2\)  
\(^1\)MS Laboratory/Univ. Bordeaux, France; \(^2\)IRT SAINT EXUPERY, France

14:20  
**Immunity Macro Model for Linear Regulator Considering Internal Terminal Voltage**  
Tohlu Matsushima, Hidetoshi Miyahara, Takashi Hisakado, Osami Wada  
Kyoto University, Japan

14:40  
**Modeling of Trench Structures in Integrated Circuits for Fast Isolation Effectiveness Assessment**  
Merce Grau Novellas\(^1\), Ramiro Serra\(^2\), Matthias Rose\(^3\)  
\(^1\)Eindhoven University of Technology, The Netherlands; \(^2\)Eindhoven University of Technology, The Netherlands; \(^3\)NXP Semiconductors, The Netherlands

15:00  
**Behavioural Model Based Simulation of the ESD- Soft-Failure-Robustness of Microcontroller Inputs**  
Suayb Cagri Yener\(^1\), Stephan Frei\(^2\), Stanislav Scheier\(^3\)  
\(^1\)Sakarya University (Universitesi), Turkey; \(^2\)TU Dortmund University; \(^3\)TU Dortmund University

15:20  
**A Highly EMI-Immune Folded Cascode OpAmp in 0.18 µm CMOS Technology**  
Subrahmanyam Boyapati\(^1\), Jean-Michel Redoute\(^2\), Maryam Shojaei Baghini\(^1\)  
\(^1\)IITB-MONASH RESEARCH ACADEMY, IIT-Bombay, India; \(^2\)MONASH University, Australia

OS 17 (O_Th_B3)  
**ORAL SESSION**

**ANTENNAS**  
Chair: Andrzej Kucharski, Wroclaw University of Technology, Poland  
Room: B (C-13)

**Time:** 16:00 - 17:30

16:00  
**Study of metamaterial resonators for decoupling of a MIMO-PIFA system**  
Ignacio Gil, Raúl Fernández-García  
Department of Electronic Engineering, Universitat Politecnica de Catalunya, Spain

16:22  
**Improved Isolation Between Closely Spaced Multiple Dipole Antennas Using a Metasurface Structure**  
Muhammad Kamran Khattak\(^1\), Changhyeong Lee\(^1\), Dajung Han\(^1\), Jeongho Ju\(^2\), Sunghuk Kang\(^1\)  
\(^1\)Incheon national university, Korea, Republic of South Korea; \(^2\)SK Hynix, Icheon, Korea, Republic of South Korea

16:45  
**Miniaturized Printed Giuseppe-Peano Fractal Monopole Blade Antenna**  
Hamed Tahmasbi, Hadi Aliakbarian  
K.N.Toosi University of Technology, Iran, Islamic Republic of

17:07  
**Design of UWB Printed Monopole Antenna with Short Stub**  
Nobuyasu Takemura, Daiki Kaneko, Joichiro Suzuki, Takuya Takeda, Takefumi Hiraguri  
Nippon Institute of Technology, Japan
Exhibition Plan (building C)
OS 18 (O_Th_C3) ORAL SESSION

Time: 16:00 - 17:30

FILTERS
Chaired by: Andrzej Sowa, Wroclaw University of Technology, Poland, Poland

Room: C (C-13)

16:00 High Performance Broadband Noise Filter Using Inductance Cancellation Technique and Various Capacitors
Yasuhiro Shiraki1, Naoto Oka2, Yuichi Sasaki2, Hideyuki Ohashi2
1Advanced Technology R&D Center, Mitsubishi Electric Corporation; 2Information Technology R&D Center, Mitsubishi Electric Corporation

16:22 Optimizing Capacitor Placement in EMI-Filter using Back Annotation of 3D Field Coupling Parameters in Circuit Models
Niek Moonen1, Frits Buesink1, Frank Leferink1,2
1University of Twente, Ne herlands, The; 2Thales Nederland B.V., Netherlands, The

16:45 A Wide Differential Passband Filter with Common Mode Suppression Property Based on Left Handed Metamaterial Transmission Line
Amir Attar, Mojtaba Joodaki
Ferdowsi University of Mashhad, Iran, Islamic Republic of

17:07 Current Barriers to Confine High Frequency Common Mode Currents
Niek Moonen1, Frits Buesink1, Frank Leferink1,2
1University of Twente, Ne herlands, The; 2Thales Nederland B.V., Netherlands, The

Posters

P 2 POSTER SESSION

Time: 9:50 - 12:30

POSTER SESSION 2
Chaired by: Paweł Bieńkowski, Wroclaw University of Science and Technology, Poland

Poster area (C-13)

P 2 (1) Simulation of shielding performance against near field coupling to EMI filter for power electronic converter using FEM
Keita Takahashi1, Yuichiro Murata1, Naohisa Uehara1, Hideto Maniwa1, Yusuke Tsubaki1, Tetsuro Fujiwara2
1Mitsubishi Electric Corporation, Japan; 2Mitsubishi Electric Engineering Co., Ltd.

P 2 (2) Effect of Standby Mode Operation of Some Household Appliances on Disturbance Voltage and Current in Frequency Range of 9-150 kHz Produced by Other Equipment in Low Voltage Network
Budi Sudiarto, Aji Nur Widyanto, Holger Hirsch
ETS Universität Duisburg-Essen, Germany

P 2 (3) On Improving Frequency-to-Voltage Converter immunity versus fast transient pulses
Kamel ABOUDA, Yuan GAO, Patrice BESSE
NXP, France

P 2 (4) Evaluation and Minimization of Conducted Emissions of Electromagnetic Interference Noise Generated by Power Factor Correction
Mohamed MILOUDI, Abdelber BENDAOUD, Houcine MILOUDI
APELEC Laboratory, Algeria
P 2 (5) **Interpretation of Conducted Immunity Tests by Means of Conformal Mapping**
Bruno Audone¹, Roberto Colombo²
¹EMC Consultant, Italy; ²IMQ EMC Lab manager

P 2 (6) **Study of Propagation of the Current and Voltage Waves Induced by the Lightning Discharge in the Resistive Cable Line with Linear and Nonlinear Elements**
Vasily Yu. Belashov¹,², Elena S. Belashova³
¹Kazan (Volga Region) Federal University, Russian Federation; ²Kazan State Power Engineering University, Russian Federation; ³Kazan National Research Technical University named after A.N. Tupolev, Kazan, Russian Federation

P 2 (7) **PROGRESS Project: Improving the Resilience of Satellite Ground Station Infrastructures**
Sebastian Schopferer¹, Christoph Michalski¹, Martin Schimmerohrn¹, Nicolas Ribièr-Tharaud², Jean-Christophe Joly³, Alain Rouquand⁴, Stephen Crabbe⁵
¹Fraunhofer Ernst-Mach-Institut (EMI), Germany; ²CEA-Gramat, France; ³Crabbe Consulting Ltd, Germany

P 2 (8) **Analytical Model of DC-DC Converters Based on Switching Impedances and EMI Sources**
Achour Ales¹, Abdelhalim zaoui¹, Jean Luc Schanen², James Roudet²
¹Ecole Militaire Polytechnique, Algeria; ²University of Grenoble

P 2 (9) **Verification and Enforcement of Passivity through Direct Minimal Modification of Equivalent Circuits**
Ata Zadehgol
University of Idaho, United States of America

P 2 (10) **Sensitivity of the Performance Statistics Provided by ISO 13528:2015 to Malfunctions of Participants Assessing Workers' Electromagnetic Field Exposure During Interlaboratory Comparison**
Jolanta Karpowicz¹, Jaroslav Kieliszek², Jaromir Sobiech², Krzysztof Gryz¹, Robert Puta²
¹Central Institute for Labour Protection - National Research Inst.(CIOP-PIB), Warszawa, Poland; ²Military Institute of Hygiene and Epidemiology, Warszawa, Poland

P 2 (11) **Common Mode and Differential Mode Characteristics of AC Motor for EMC Analysis**
miloudi houcine, miloudi mohamed
university of sidi bel abbes, Algeria

P 2 (12) **MeerKAT Radio Telescope Electromagnetic Coupling Investigations**
Pieter Gideon Wiid, Stanley Oko h Kuja, Temwani Joshua Phiri
Stellenbosch University, South Africa

P 2 (13) **Modeling of EMI Filters With Shields Placed Between The Filter Components**
Aivis Asmanis, Gundars Asmanis, Deniss Stepins, Leonids Ribickis
Riga Technical University

P 2 (14) **Analysis of electromagnetic couplings in LTCC microcircuits**
Dariusz Klepacki¹, Wieslaw Sabat¹, Kazimierz Kamuda¹, Stanislav Slosarčík², Dominik Demeter²
¹Rzeszów University of Technology, Poland; ²Technical University of Košice, Slovak Republic

P 2 (15) **Influence of Electrode Surface Roughness in Electromagnetic Radiation due to Micro Gap ESD**
Kenichiro Abe¹, Ken Kawamata¹, Shigeki Minegishi¹, Osamu Fujiwara²
¹Tohoku Gakuin University, Japan; ²Nagoya Institute of Technology
P 2 (16) **The Prediction of Radio Frequency Interference from HVDC-flexible Converter Valve**
Weidong Zhang\(^1\), Qian Wan\(^1\), Lei Qi\(^1\), Donglai Zhao\(^2\), Guoliang Zhao\(^2\), Linhai Cai\(^2\)
\(^1\)North China Electric Power University, People’s Republic of China; \(^2\)China Electric Power Research Institute

P 2 (17) **Analysis of Dependence Factors of Body Shadow Effect of Body-worn Dosimeters in Outdoor and Indoor Scenarios**
Silvia de Miguel-Bilbao\(^1\), Blas Juan\(^2\), Karpowicz Jolanta\(^3\), Ramos Victoria\(^1\)
\(^1\)Carlos III Health Institute, Spain; \(^2\)University of Valladolid; \(^3\)Central Institute for Labour Protection

P 2 (18) **Improvements in Alternative Radiated Emission Test Methods With Surface Wire**
Bahadir Tektas, Osman Sen, Soydan Cakir, Mustafa Cetintas
TUBITAK UME, Turkey

P 2 (17) **IBIS measurement based on static and quasi-static method**
Adil EL ABBAZI\(^1\), Vincent FONTAINE\(^2\), Nicolas MONNEREAU\(^1\), Alain SAUVAGE\(^2\), Anass JABER\(^1\)
\(^1\)SERMA INGENIERIE, France; \(^2\)AIRBUS OPERATIONS, FRANCE

P 1 (10) **Model of the Minimum Requirements Regarding Electric and Magnetic Field Strength Measurement Devices for Use in the Near-Field Occupational Exposure in Compliance Testing with Respect to the Requirements of European Directive 2013/35/EU**
Jolanta Karpowicz\(^1\), Paweł Bienkowski\(^2\), Jarosław Kieliszek\(^3\)
\(^1\)Central Institute for Labour Protection - National Research Inst.(CIOP-PIB), Warszawa, Poland; \(^2\)Wroclaw University of Technology, Wroclaw, Poland; \(^3\)Military Institute of Hygiene and Epidemiology, Warszawa, Poland

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**POSTER SESSION**

**Time:** 13:30 - 15:30

**Poster Session 3**

Chaired by: Dariusz Klepacki, Rzeszów University of Technology, Poland

**Poster area (C-13)**

P 3 (1) **A Novel FDTD Approach for Numerical Dosimetry at a Single Frequency**
Jerdvisanop Chakarothai, Kanako Wake, Soichi Watanabe
National Institute of Information and Communications Technology, Japan

P 3 (2) **Band-Gap Limits Prediction for Effective Noise Coupling Reduction in Microwave Circuits Metallic Enclosures**
Muhammet Hilmi Nisanci\(^1\), Francesco de Paulis\(^2\), Antonio Orlandi\(^2\)
\(^1\)Sakarya University, Turkey; \(^2\)University of L’Aquila

P 3 (3) **Investigation of Interference with Medical Devices by Power Line Communication to Promote Its Safe Introduction to the Clinical Setting**
Kai Ishida\(^1\), Eisuke Hanada\(^2\), Minoru Hirose\(^3\)
\(^1\)Division of Healthcare Informatics, Faculty of Healthcare, Tokyo Healthcare University, Tokyo, Japan; \(^2\)Department of Information Science, Faculty of Science and Engineering, Saga University, Saga, Japan; \(^3\)Department of Clinical Engineering, School of Allied Health Science, Kitasato University, Kanagawa, Japan
P 3 (4)  Experiments on the Effect of Reflections from EUT Set-up Tables by Materials in Radiated Emission Measurements above 1 GHz to 18 GHz  
Yutaka Takeuchi, Hiroyuki Shimanoe, Hironori Tanaka, Hidenori Muramatsu  
VCCI Council / Canon Inc.

P 3 (5)  Emission Source Localization using the Method of Auxiliary Sources  
Revaz S Zaridze, Vasil Tabatadze, Ivan Petoev, David Kakulia, Tornike Tchabukiani  
Tbilisi State University, Georgia

P 3 (6)  Equivalent Circuit Identification of Standby Mode Operation for Some Household Appliances in Frequency Range 9-150 kHz for the Investigation of Conducted Disturbance in Low Voltage Installations  
Budi Sudiarto, Aji Nur Widyanto, Holger Hirsch  
ETS Universität Duisburg-Essen, Germany

P 3 (7)  Design of a Marx Generator for HEMP Filter Evaluation Taking Account of Parasitic Effect of Components  
Jiafeng Zhou  
University of Liverpool, United Kingdom

P 3 (8)  Experimental Analysis of Noise Level and Channels Availability for High Frequency OFDM data transmission in NVIS propagation conditions  
Paul Bechet¹, Simona Miclaus¹, Antoniu Miclaus², Cornel Balint³  
¹Land Forces Academy, Romania; ²Technical University of Cluj Napoca; ³Politehnica University of Timisoara

P 3 (9)  Integrated Modeling of a Motor Driven System for Analysis of Conducted Emissions  
Sangwon Yun¹, Jungrae Ha¹, Minho Kim¹, Chanho Lee¹, Youngsik Kim¹, Jiyoon Yoo²  
¹Mando, Korea, Republic of South Korea; ²Korea University, Republic of South Korea

P 3 (10)  Large equipment emission testing in underground mines  
Marek Piotr Michalak, Monika Ewelina Szafranska, Karolina Natalia Spalt  
National Institute of Telecommunications, Poland

P 3 (11)  Influencing Factors on the Directivity Estimates of an Electrically Large EUT  
Xiaowei Wang, Ralf Vick  
Otto-von-Guericke-University, Magdeburg, Germany, Germany

P 3 (12)  Mains Power Synchronous Conducted Noise Measurement in the 2 to 150 kHz band  
Cees Keyer¹,², Frits Buesink², Frank Leferink²,³  
¹Amsterdam University of applied sciences Amsterdam, the Netherlands; ²Twente University Enschede the Netherlands; ³Thales Nederland B.V. P.O. Box 42, 7500 GD Hengelo, Netherlands

P 3 (13)  Dynamic In-Line Analysis of Electrostatic Discharge Resistive-Capacitive Time Constant  
Mike Hertz, Dan Steinken  
Teledyne LeCroy, United States of America

P 3 (14)  Passive Magnetic Field Compensation of Existing Underground Cables  
Pablo Frezzi¹, Roland Hug¹, Jodee Grant¹, Alex Klingler²  
¹General Electric, Switzerland; ²CFW EMV-Consulting, Switzerland

P 3 (15)  The Short Time Fourier Transform and the Spectrograms to Characterize EMI Emissions  
Bruno Audone¹, Roberto Colombo², Ilario Marziani³  
¹EMC Consultant, Italy; ²IMQ EMC Lab manager; ³Aleniaspace EMC specialist
P 3 (16) **Analysis of the Radiated Susceptibility of a Transmission Line under Near and Far-field Conditions**
Zhao Zhao, Marco Leone
Otto-von-Guericke Universitaet Magdeburg, Germany

P 3 (17) **Recommended Sample Size of ESD and Surge Immunity Tests**
Dick Harberts
Philips Innovation Services, The Netherlands

P 3 (18) **Methodology for signals compatibility assessment in aeronautic environment**
Alexandre HERVE¹, Richard PERRAUD¹, Claude CUILLER², Sebastien POISSON², Gaël Frazier²
¹Airbus Group Innovations, France; ²Airbus, France

P 3 (19) **Analysis Methodology for Spectrum Sharing between Medical Implants and Digital Broadcasting**
Haim Mazar
ATDI, Poland

### Meetings

**MEETING 8**
**Time:** 9:50 - 12:30

**EU Project Initiators’ Meeting**

Chaired by: Davy Pissoort, KU Leuven, Belgium

**Room:** E (C-13)

**MEETING 6**
**Time:** 15:30 - 18:00

**EMC Europe International Steering Committee Meeting**

Chaired by: Andy Marvin, University of York, York EMC Services Ltd, UK
Jan Carlsson, Provinn, Sweden

**Room:** E (C-13)
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<th>SESSION or BREAK</th>
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<th>Room C (bldg. C-13 / 1.28)</th>
<th>Room D (bldg. C-13 / 1.27)</th>
<th>Room E (bldg. C-13 / 0.31)</th>
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<tr>
<td>9:00</td>
<td>Workshop 8D Frequency Policy and Spectrum Engineering: &quot;General Procedures on Spectrum Management&quot;</td>
<td>Workshop 9A Automotive EMC</td>
<td>Organizer / Chair: Marco Klingler Peugeot Citroen Automobiles - Groupe PSA</td>
<td>Tutorial 2A Improved EMC Test Methods in Industrial Environments</td>
<td>Workshop 10 The importance of and challenges posed by traceable calibration of Harmonic and Flicker meters</td>
<td>Organizer / Chair: Soydan Cakir TUBITAK UME, Turkey</td>
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<tr>
<td>9:50</td>
<td>Coffee break (conference building C-13, hall)</td>
<td>Room A (bldg. C-13 / 1.31)</td>
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<tr>
<td>10:30</td>
<td>Workshop 8E Frequency Policy and Spectrum Engineering: &quot;Digital audio broadcasting spectrum and networks&quot;</td>
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<td>Tutorial 2B Improved EMC Test Methods in Industrial Environments</td>
<td>Organizer / Chair: Soydan Cakir TUBITAK UME, Turkey</td>
<td>Organizer / Chair: Heiko Wilke Ametek CTS, Germany</td>
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<td>10:30</td>
<td>Workshop 9B Automotive EMC</td>
<td>Organizer / Chair: Marco Klingler Peugeot Citroen Automobiles - Groupe PSA</td>
<td>Tutorial 2B Improved EMC Test Methods in Industrial Environments</td>
<td>Organizer / Chair: Soydan Cakir TUBITAK UME, Turkey</td>
<td>Organizer / Chair: Heiko Wilke Ametek CTS, Germany</td>
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<tr>
<td>12:30</td>
<td>Lunch (Canteen, building C-18, Hoene-Wronskiego Str. 10)</td>
<td>Room A (bldg. C-13 / 1.31)</td>
<td>Room B (bldg. C-13 / 1.30)</td>
<td>Room C (bldg. C-13 / 1.28)</td>
<td>Room D (bldg. C-15 / SAC)</td>
<td>Room E (bldg. C-13 / 0.31)</td>
</tr>
<tr>
<td>14:00</td>
<td>Workshop 8F Frequency Policy and Spectrum Engineering: &quot;Future technologies on spectrum management&quot;</td>
<td>Workshop 9C Automotive EMC</td>
<td>Organizer / Chair: Marco Klingler Peugeot Citroen Automobiles - Groupe PSA</td>
<td>Tutorial 2C Improved EMC Test Methods in Industrial Environments</td>
<td>Organizer / Chair: Soydan Cakir TUBITAK UME, Turkey</td>
<td>Workshop 11B Practical approach for choosing the optimal antenna for RF EM field immunity tests</td>
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<td>14:00</td>
<td>Workshop 9C Automotive EMC</td>
<td>Organizer / Chair: Marco Klingler Peugeot Citroen Automobiles - Groupe PSA</td>
<td>Tutorial 2C Improved EMC Test Methods in Industrial Environments</td>
<td>Organizer / Chair: Soydan Cakir TUBITAK UME, Turkey</td>
<td>Workshop 11B Practical approach for choosing the optimal antenna for RF EM field immunity tests</td>
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<td>15:30</td>
<td>Coffee break (conference building C-13, hall)</td>
<td>Room A (bldg. C-13 / 1.31)</td>
<td>Room B (bldg. C-13 / 1.30)</td>
<td>Room C (bldg. C-13 / 1.28)</td>
<td>Room D (bldg. C-13 / 1.27)</td>
<td>Room E (bldg. C-13 / 0.31)</td>
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<tr>
<td>16:00</td>
<td>Workshop 9D Automotive EMC</td>
<td>Organizer / Chair: Marco Klingler Peugeot Citroen Automobiles - Groupe PSA</td>
<td>Tutorial 2D Improved EMC Test Methods in Industrial Environments</td>
<td>Organizer / Chair: Soydan Cakir TUBITAK UME, Turkey</td>
<td>Workshop 11B Practical approach for choosing the optimal antenna for RF EM field immunity tests</td>
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<tr>
<td>17:30</td>
<td>Workshop 9D Automotive EMC</td>
<td>Organizer / Chair: Marco Klingler Peugeot Citroen Automobiles - Groupe PSA</td>
<td>Tutorial 2D Improved EMC Test Methods in Industrial Environments</td>
<td>Organizer / Chair: Soydan Cakir TUBITAK UME, Turkey</td>
<td>Workshop 11B Practical approach for choosing the optimal antenna for RF EM field immunity tests</td>
<td></td>
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</table>

MEETING 7
Polish Committee on Lightning Protection Meeting (14:00 – 16:00)
Chair: Grzegorz Maslowski
Rzeszow University of Technology, Poland
Tutorials

TUT 2

TUTORIAL 2

IMPROVED EMC TEST METHODS IN INDUSTRIAL ENVIRONMENTS

Time: 9:00 - 17:30

Chaired by: Soydan Çakir, TÜBİTAK UME, Turkey

Room: C (C-13)

Speakers: Soydan Çakir (TÜBİTAK UME), Mohammed Salhi (TÜBİTAK UME), Dongsheng Zhao (Dutch Metrology Institute), Marek Svoboda (Czech Metrology Institute), Pavel Hamouz (Czech Metrology Institute), Frederic Pythoud (METAS), Francois Ziadé (LNE), Miha Kokalj (SIQ), Hüseyin Çayci (TÜBİTAK UME), Frits Buesink (University of Twente)

Sessions:

TUT 2A (9:00 - 10:30)

Alternative Conducted Emission Test Methods Based On RF Impedance Measurement
Soydan Çakir
TÜBİTAK UME, Turkey

Alternative Conducted Immunity Test Methods in Absence of Common Mode Impedance Requirements
Soydan Çakir
TÜBİTAK UME, Turkey

TUT 2B (11:00 - 12:30)

Lunch

Alternative Radiated Immunity Test Methods
Mohammed Salhi
TÜBİTAK UME, Turkey

TUT 2C (14:00 - 15:30)

Coffee break

In-situ impedance measurement for stationary EUTs
Dongsheng Zhao
VSL, Dutch Metrology Institute, The Netherlands

BCI Immunity tests and its critical point
Marek Svoboda
CMI, Czech Metrology Institute, Czech Republic

TUT 2D (16:00 - 17:30)

Abstract:

Development and maintenance of the EMC measurement facilities in accordance with standards are heavy loads for industry. Using the facility in EMC laboratories is a solution but expensive and time consuming and in most cases, it is not possible for large or stationary EUTs (Equipment Under Test). Improved methodologies and procedures are required for industry in terms of EMC test and measurement applications. The main obstacle is that relations are not clear between the measurement results of these alternative EMC test methods and the standard test methods in industry.

This tutorial session intends to present an overview of the most recent European research activities in the field of improved alternative EMC test methods for conducted/radiated emission and immunity tests. Furthermore part of program is dedicated to Round Robin Test devices and traceable LISN calibration kits.

Programme:

TUT 2A session

Time: 9:00 - 10:30

Alternative Conducted Emission Test Methods Based On RF Impedance Measurement
Soydan Çakir
TÜBİTAK UME, Turkey

Alternative Conducted Immunity Test Methods in Absence of Common Mode Impedance Requirements
Soydan Çakir
TÜBİTAK UME, Turkey

Alternative Radiated Immunity Test Methods
Mohammed Salhi
TÜBİTAK UME, Turkey

TUT 2B session

Time: 11:00 - 12:30

Alternative Radiated Emission Test Methods
Mohammed Salhi
TÜBİTAK UME, Turkey

In-situ impedance measurement for stationary EUTs
Dongsheng Zhao
VSL, Dutch Metrology Institute, The Netherlands

BCI Immunity tests and its critical point
Marek Svoboda
CMI, Czech Metrology Institute, Czech Republic
**TUT 2C session**

**Time: 14:00 - 15:30**

**Effects of test setup in radiated immunity measurements**

Pavel Hamouz  
CMI, Czech Metrology Institute, Czech Republic

**How to perform conducted immunity measurements according to 61000-4-6 and how to validate the setup**

Frederic Pythoud  
METAS, Switzerland

**Impact of adapters on LISN’s input impedance calibration: How to improve accuracy and reliability of the measurements (Part 1)**

Francois Ziadé (1), Miha Kokalj (2)
(1) LNE, France  
(2) SIQ, Slovenia

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**TUT 2D session**

**Time: 16:00 - 17:30**

**Impact of adapters on LISN’s input impedance calibration: How to improve accuracy and reliability of the measurements (Part 2)**

Francois Ziadé (1), Miha Kokalj (2)
(1) LNE, France  
(2) SIQ, Slovenia

**Design of a programmable Round Robin Test Device for Steady-State Harmonics**

Hüseyin Çayci  
TÜBİTAK UME, Turkey

**Evaluation of a pc-oscilloscope based test setup for flicker & harmonic measurements with high accuracy**

Hüseyin Çayci  
TÜBİTAK UME, Turkey

**EMC for Large Installations**

Frits Buesink  
University of Twente, The Netherlands

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**Workshops**

**WS 8**  
**WORKSHOP 8**

**Time: 9:00 - 15:30**

**FREQUENCY POLICY AND SPECTRUM ENGINEERING**

**Organized by:**  
Dariusz Więcek  
National Institute of Telecommunications, Poland

**Room:**  
A (C-13)

**Speakers:**  
Haim Mazar (ATDI and guest professor at Xihua University), Milan Mizera (Regulatory authority for Electronic Communications and Postal Services), Peter Vári (National Media and Infocommunications Authority), Marcin Karolak (Office of Electronic Communication), Wojciech Pienkowski (Office of Electronic Communication), Yvette Dore (Digital Radio UK), Graham Dixon (EBU), Krystyna Roslan-Kuhn (National Broadcasting Council Republic of Poland), Gunnar Garfors (IDAG & NRK), Ronald Lorenz (Media Broadcast), Halina Uryga (Orange), Bartłomiej Gołębiowski (Nokia Bell Labs), Fabiano Chaves (Nokia Bell Labs), Przemysław Pawełczak (Delft University of Technology)
Sessions:

**WS 8D**
(9:00 - 10:30)

Coffee break

**WS 8E**
(10:30 - 12:30)

Lunch

**WS 8F**
(14:00 - 15:30)

Abstract:
The current technology progress has a big influence on society behaviour and experiences, new technology are rapidly growing. Such situation requires adaption of new technology both on transmission and reception sites and new frequency policy paradigm shifts. The aim of the workshop is presenting, discussing and proposing solutions for future broadcasting and mobile networks, audio and video content delivering as well as highlight potential of future spectrum policy and engineering potential. In this context the motto is „Perspectives of Terrestrial Broadcasting and Mobile Networks“. The workshop is organized within project Frequency Policy and Spectrum Engineering in V4 countries supported by Visegrad Fund.

More information about this workshop is available on: [http://www.fpse2016.nit.eu/](http://www.fpse2016.nit.eu/)

Programme:

**WS 8D session**
"General Procedures on Spectrum Management"
Chair: Jiří Duchač

Time: 10:30 - 12:30

**Results of WRC15 and ITU-R Study Groups activities for WRC19**

Haim Mazar
ATDI and guest professor at Xihua University

**Frequency Management in the Environment of the Slovak Republic**

Milan Mizera
Frequency Spectrum Management, Regulatory authority for Electronic Communications and Postal Services, Slovak Republic

**Spectrum outlook**

Peter Vari
National Media and Infocommunications Authority of Hungary

**Technological and legal aspects of 700 MHz refarming in Poland – state of play after release of 800 MHz**

Marcin Karolak (1), Wojciech Pieńkowski (2)
(1) Frequency Management Department in Office of Electronic Communications
(2) Office of Electronic Communications

**WS 8E session**
"Digital audio broadcasting spectrum and networks "
Chair: Miroslaw Ostrowski

Time: 14:00 - 15:30

**DAB digital radio – a platform for Europe**

Graham Dixon
EBU

**Digital: serving audiences, serving society– a UK case study**

Yvette Dore
Digital Radio UK

**Can radio remain analogue in a digital world?**

Krystyna Roslan-Kuhn
National Broadcasting Council Republic of Poland
A Countdown to the World's First FM Switch-off: 4 Months to Go
Gunnar Garfors
IDAG, Advisor at NRK

The Future of Audio Broadcasting in Germany - Digital
Ronald Lorenz
Media Broadcast

WS 8F session
"Future technologies on spectrum management"
Chair: Krystyna Rosłan-Kuhn  
Time: 16:00 - 17:30

New frequency bands for 5G/IMT-2020
Halina Uryga
Spectrum Office of the Orange's Group

Future spectrum technologies for Mobile Broadband
Bartłomiej Gołębiowski
Nokia Bell Labs

Spectrum sharing in 28GHz band: feasibility of 5G and FSS (Fixed Satellite Service) co-existence.
Fabiano Chaves
Nokia Bell Labs

White Space Database Connectivity for Mobile Devices: First Experiments
Przemysław Pawelczak
Delft University of Technology

Closing Workshop (unofficial)

WS 9 WORKSHOP 9
Time: 9:00 - 17:30

AUTOMOTIVE EMC

Chaired by: Marco Klingler, Peugeot Citroen Automobiles, France Room: B (C-13)

Speakers: Marco Klingler (Peugeot Citroen Automobiles), Dirk Schäfer & Dennis Hasselberg (BMW Group), Roman Jobava & Ekaterina Yavolovskaya (EM Consulting and Software, EMCoS Ltd), Benjamin Willmann & Oussama Sassi (Volkswagen AG), Frederic Bocquet (ANSYS), Mateusz Będkowski (ANSYS), Amazir Moknache (ANSYS), Domenico Lorricchio (ANSYS), Stephan Frei & Abid Mushtaq (TU Dortmund), Mauro Feliziani (University of L’Aquila), Markus Schick (Altair Engineering), Andreas Barchanski (CST AG), Franz Hirtenfelder (CST AG), Maximilian J. Schwaiger (Dätwyler Cable), Diego Cuartielles (Audi AG), Ferran Silva (Universitat Politècnica de Catalunya), Philipp Hillenbrand & Jan Hansen (Robert Bosch GmbH), Jean-Roger K. Kuvedu-Libla (Delphi Electronics & Safety)

Sessions:

WS 9A (9:00 - 10:30)
Coffee break
WS 9B (10:30 - 12:30)
Lunch

Abstract:
Automotive electric / electronic systems are endlessly growing in complexity with a permanent constraint of a constant or reduced time-to-market. Therefore, there is a strong need to constantly improve the efficiency of the EMC related tasks throughout the entire development process, starting from the design phase until the full-vehicle validation phase. This workshop intends to present an overview of the most recent industrial advances in the field of automotive EMC design, modeling and simulation as well as in the field of automotive standards, testing and measurements. The presentations in this workshop will cover EMC issues at
system, subsystem, equipment and component levels. In particular, topics addressed by the speakers will include hybrid power-train systems EMC analysis, antenna implementation, equipment design, printed-circuit-board optimization, and electric/electronic component characterization.

Programme:

**WS 9A session**  
**Time:** 9:00 - 10:30

**Online EMC Numerical Simulation**  
Marco Klingler  
Groupe PSA, Vélizy-Villacoublay, France

*Keep it mobile – An approach for system to vehicle level testing of electric and hybrid powertrains*  
Dirk Schäfer, Dennis Hasselberg  
BMW Group, Munich, Germany

**New Software Solution for Low Frequency Human Exposure Simulations in Electrical Vehicles**  
Roman Jobava (1), Ekaterina Yavalovskaya (1), Benjamin Willmann (2), Oussama Sassi (2)  
(1) EM Consulting and Software, EMCoS Ltd., Tbilisi, Georgia  
(2) Volkswagen AG, Germany

**WS 9B session**  
**Time:** 11:00 - 12:30

**Antennas and Wireless Devices Interferences Simulations within a vehicle**  
Frederic Bocquet (1), Mateusz Będkowski (2), Amazir Moknache (1), Domenico Lorricchio (3)  
(1) ANSYS France SAS, Montigny Le Bretonneux, France  
(2) ANSYS-SYMKOM Poland, Warszawa, Poland  
(3) ANSYS Italy, Milano, Italy

**Active Shielding/Filtering for Noise Reduction on HV Cable Systems**  
Stephan Frei, Abid Mushtaq  
TU Dortmund University

**Magnetic field reduction in automotive wireless charging systems**  
Tommaso Campi (1), Silvano Cruciani (1), Valerio De Santis (1), Francesca Maradei (2), Mauro Feliziani (1)  
(1) University of L’Aquila - DIIIIE, L’Aquila, Italy  
(2) Sapienza University of Rome - DIAAE, Rome, Italy

**WS 9C session**  
**Time:** 14:00 - 15:30

**Simulation of Emissions and Immunity for PCBs and Other Devices Inside Vehicles**  
Markus Schick (1), Eddy Jehamy (2)  
(1) Altair Engineering GmbH, Böblingen, Germany  
(2) Altair Engineering France, Anthony, France

**Transmission behavior of unshielded data cables in close presence to metal trays**  
Andreas Barchanski (1), Franz Hirtenfelder (1), Maximilian J. Schwaiger (2)  
(1) CST AG, Munich, Germany  
(2) Dätwyler Cables, Hallbergmoos, Germany

**Benchmark from magnetic field measurement devices**  
Diego Cuartielles  
Audi AG, Ingolstadt, Germany
WS 9D session

**Automotive EMI measurements with multichannel time-domain systems**
Ferran Silva, Marc Aragón, Marc Pous, Marco Azpúrua
Universitat Politècnica de Catalunya-BarcelonaTech, Barcelona, Spain

**EMI-Simulation of a SiC based DCDC-Converter in a CISPR25 component test setup**
Philipp Hillenbrand, Jan Hansen
Robert Bosch GmbH, Germany

**Simple Decoupling and Coupling Strategies of Electromagnetic Disturbances from/on Cable Harnesses when using Automotive Component Testing Methods**
Jean-Roger K. Kuvedu-Libla
Delphi Electronics & Safety, Bascharage, Luxembourg

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**WS 10**

**WORKSHOP 10**

The importance of and challenges posed by traceable calibration of Harmonic and Flicker meters

Chaired by: Grigory Suprun, Newtons4th Ltd
Room: D (C-13)

Speakers: Grigory Suprun, Newtons4th Ltd

Sessions:

**WS 10**

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<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<td>9:00 - 10:30</td>
<td>Programme: The importance of and challenges posed by traceable calibration of Harmonic and Flicker meters</td>
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Speakers: Grigory Suprun, Newtons4th Ltd

Sessions:

**WS 11**

**WORKSHOP 1**

Practical approach for choosing the optimal antenna for RF EM field immunity tests

Chaired by: Heiko Wilke, AMETEK CTS, Germany
Room: D (C-13)

Speakers: Heiko Wilke, AMETEK CTS, Germany

Sessions:

**WS 11A**

(10:30 - 12:30)
Lunch

**WS 11B**

(14:00 - 15:30)
Coffee break

Abstract: Main target of this workshop is to discuss correct selection of transmitting antenna for immunity test to radio frequency electromagnetic field. Impact of transmitting antenna parameters (radiation pattern and gain) as well as the distance to EUT onto testing area size and field uniformity will be shown as well. For better understanding workshop consists of two parts: theoretical (1) and practical (2). Theoretical part is the tutorial with presentation conducted in the classroom.
Practical part (2) contains real tests and experiments performed by participants in 10m SAC located in EMC lab of Wroclaw University of Science and Technology. For this reason practical part of the workshop is limited for about 10 participants only. Attendee list will be available during the conference at the reception desk.

Programme:

**WS 11A session**

Practical Approach for Choosing the Optimal Antenna for RF EM Field Immunity Tests – Introduction (part 1)
Heiko Wilke
AMETEK CTS, Germany

**WS 11B session**

Practical Approach for Choosing the Optimal Antenna for RF EM Field Immunity Tests – Experiments in EMC lab (part 2)
Heiko Wilke
AMETEK CTS, Germany

Location: EMC lab (bldg. C-15)

*This practical part of the workshop is limited for about 10 participants only. Attendee list will be available during the conference at the reception desk.*

**Meeting**

**MEETING 7**

Polish Committee on Lightning Protection Meeting

Chaired by: Grzegorz Maslowski
Rzeszow University of Technology, Poland

Room: E (C-13)
图1 传热发射测试系统（PK 测试器）

图2 液体测试系统

图3 电磁兼容测试系统

图4 电路测试系统

3.2 融合分析

在高压电路中，电路中的电磁兼容问题往往采用结合模式进行综合分析。结合模式是指在电路设计阶段，通过对电路的详细分析，确定电路的电磁兼容性。

3.2.1 结合模式

结合模式包括电路设计、电路测试和电路模拟等多个环节。在电路设计阶段，通过对电路的详细分析，确定电路的电磁兼容性。在电路测试阶段，通过对电路的详细测试，评估电路的电磁兼容性。在电路模拟阶段，通过对电路的详细模拟，评估电路的电磁兼容性。
Exhibition

Exhibition booths are presented on the ground floor in the conference building C-13. From 9:00 to 17:00 you are invited to attend the exhibiting companies.

Exhibitor Information

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<tr>
<th>Exhibitor</th>
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<tr>
<td>Altair Engineering GmbH</td>
<td>24</td>
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<tr>
<td>AMETEK CTS Germany GmbH</td>
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<tr>
<td>AM Technologies Sp. z o.o. Sp.k.</td>
<td>14</td>
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<tr>
<td>AR Europe &amp; UEI</td>
<td>9</td>
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<tr>
<td>ASTAT Sp. z o.o.</td>
<td>6</td>
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<tr>
<td>ATDI Advanced Radiocommunications</td>
<td>4</td>
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<tr>
<td>CST - Computer Symulation Technology AG</td>
<td>2</td>
</tr>
<tr>
<td>COMTEST Engineering bv</td>
<td>23</td>
</tr>
<tr>
<td>ELEKTRONIK</td>
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<td>EMCoS Consulting and Software</td>
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<td>ETS Lindgren</td>
<td>15</td>
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<td>FRANKONIA EMC TEST-Systems GmbH</td>
<td>18</td>
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<tr>
<td>HELMAR Jacek A. Dobrowiecki</td>
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<td>HIK-Consulting Krzysztof Kuc</td>
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<td>IEEE EMC Society</td>
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<td>KABELKOM Sp. z o.o.</td>
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<td>LUMILOOP GmbH</td>
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<td>Microwave Vision Group (MVG)</td>
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<td>ROHDE &amp; SCHWARZ OESTERREICH Sp. z o.o.</td>
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<td>Safety &amp; EMC Magazine</td>
<td>11</td>
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<tr>
<td>Tespol Sp. z o.o. – Tektronix</td>
<td>16</td>
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<td>TMD Technologies</td>
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The exhibition plan – see page 44.
## Exhibitor Information

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<th>Booth</th>
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<th>Address</th>
<th>Website</th>
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<tr>
<td>24</td>
<td>Altair Engineering GmbH</td>
<td>Calwer Str. 7, D-71034 Boeblingen, GERMANY</td>
<td><a href="http://www.altair.de">www.altair.de</a></td>
</tr>
<tr>
<td>5</td>
<td>AMETEK CTS Germany GmbH</td>
<td>Office in Poland, ul. Ogrodowa 31/35, 00-893 Warszawa, POLAND</td>
<td><a href="http://www.ametek-cts.com">www.ametek-cts.com</a></td>
</tr>
<tr>
<td>9</td>
<td>AR Europe &amp; UEI</td>
<td>National Technology Pk. - Ashling Bldg, 1st Floor, Castletroy, Limeric, RELAND</td>
<td><a href="http://www.ar-europe.ie">www.ar-europe.ie</a></td>
</tr>
<tr>
<td>6</td>
<td>ASTAT Sp. z o.o.</td>
<td>Dabrowskiego Str. 441, PL 60-451 Poznan, POLAND</td>
<td><a href="http://www.astat.com.pl">www.astat.com.pl</a></td>
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<tr>
<td>4</td>
<td>ATDI Advanced Radiocommunications</td>
<td>Nowy Swiat Str. 54/56, 00-363 Warszawa, POLAND</td>
<td><a href="http://www.atdi.com">www.atdi.com</a></td>
</tr>
<tr>
<td>2</td>
<td>CST - Computer Symulation Technology AG</td>
<td>Bad Nauheimer Str. 19, 64289 Darmstadt, GERMANY</td>
<td><a href="http://www.cst.com">www.cst.com</a></td>
</tr>
<tr>
<td>23</td>
<td>COMTEST Engineering bv</td>
<td>Industrieweg 12, NL-2382 NV Zoeterwoude, NETHERLANDS</td>
<td><a href="http://www.comtest.nl">www.comtest.nl</a></td>
</tr>
<tr>
<td>10</td>
<td>ELEKTORNIK</td>
<td>Magazyn Elektroniki Profesjonalnej</td>
<td><a href="http://elektronikab2b.pl">http://elektronikab2b.pl</a></td>
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<tr>
<td>19</td>
<td>EMCoS Consulting and Software</td>
<td>27 Pekin Str. 0160 Tbilisi, GEORGIA</td>
<td><a href="http://www.emcos.com">www.emcos.com</a></td>
</tr>
<tr>
<td>21</td>
<td>EMI Solutions Pvt. Ltd</td>
<td>#237-A5 Bommasandra Industrial Area, Hosur Road 560099 Bangalore, NDIA</td>
<td><a href="http://www.emisindia.com">www.emisindia.com</a></td>
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<tr>
<td>21</td>
<td>Freicomp GmbH</td>
<td>Gewerbestr. 11, D-79285 Ebringen, GERMANY</td>
<td><a href="http://www.freicomp.com">www.freicomp.com</a></td>
</tr>
<tr>
<td>15</td>
<td>ETS Lindgren</td>
<td>Mekaaniikontie 1, Fl - 27501 Eura, FINLAND</td>
<td><a href="http://www.ets-lindgren.com">www.ets-lindgren.com</a></td>
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<tr>
<td>18</td>
<td>FRANKONIA EMC TEST-Systems GmbH</td>
<td>Daimlerstr. 17, D-91301 Forchheim, GERMANY</td>
<td><a href="http://www.frankoniagroup.com">www.frankoniagroup.com</a></td>
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<td>22</td>
<td>HELMAR Jacek A. Dobrowiecki</td>
<td>Powstanców Slaskich Str. 108C/2, 01-466 Warszawa, POLAND</td>
<td><a href="http://www.helmar.com.pl">www.helmar.com.pl</a></td>
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<td>20</td>
<td>HIK-Consulting Krzysztof Kuc</td>
<td>Chabrowa Str. 16, 01-934 Warszawa, POLAND</td>
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<td>IEEE EMC Society</td>
<td></td>
<td><a href="http://www.emcs.org">http://www.emcs.org</a></td>
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<td>3</td>
<td>KABELKOM Sp. z o.o.</td>
<td>Bukowa Str. 30, 43-300 Bielsko-Biała, POLAND</td>
<td><a href="http://www.kabelkom.pl">www.kabelkom.pl</a></td>
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<tr>
<td>7</td>
<td>LUMILOOP GmbH</td>
<td>Nöthnitzer Straße 64, D-01187 Dresden, GERMANY</td>
<td><a href="http://www.lumiloop.de">www.lumiloop.de</a></td>
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<tr>
<td>8</td>
<td>Microwave Vision Group (MVG)</td>
<td>17 avenue de Norvege, 91140 Villebon-sur-Yvette, FRANCE</td>
<td><a href="http://www.mvg-world.com">www.mvg-world.com</a></td>
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<td>1</td>
<td>NDN-Zbigniew Daniuk</td>
<td>Janowskiego Str. 15, 02-784 Warszawa, POLAND</td>
<td><a href="http://www.ndn.com.pl">www.ndn.com.pl</a></td>
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<tr>
<td>17</td>
<td>ROHDE &amp; SCHWARZ ÖSTERREICH Sp. z o.o.</td>
<td>POLISH SALES OFFICE, Al. Jerozolimskie 92, floor 3, PL-00-807 Warsaw, POLAND</td>
<td><a href="http://www.rohde-schwarz.com.pl">www.rohde-schwarz.com.pl</a></td>
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<td>11</td>
<td>Safety &amp; EMC Magazine</td>
<td></td>
<td><a href="http://www.semc.cesi.cn">www.semc.cesi.cn</a></td>
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<td>16</td>
<td>Tespol Sp. z o.o. - Tektronix</td>
<td>Klecinska Str. 125, 54-413 Wroclaw, POLAND</td>
<td><a href="http://www.tespol.com.pl">www.tespol.com.pl</a></td>
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<tr>
<td>13</td>
<td>TMD Technologies</td>
<td>Swallowfield Way, Hayes, Middlesex UB3 1DQ, UNITED KINGDOM</td>
<td><a href="http://www.tmd.co.uk">www.tmd.co.uk</a></td>
</tr>
</tbody>
</table>
FEKO – a leading EM analysis software suite – is part of Altair’s HyperWorks Software Suite (the most comprehensive CAE solution e.g. for structural optimization, modeling, CFD, NVH and composites). FEKO provides solutions for a wide range of EM problems for a large variety of industries. Applications range from 3D antenna design and antenna placement to Electromagnetic Coupling and Interference (EMC, EMI) analysis, Bio-electromagnetics, 3D RF components, 3D EM circuits to radomes and scattering problems.

Besides FEKO Altair also offers further tools in the EM domain e.g. for electromechanical equipment design, for a fully automatic design of matching circuits or for designing high voltage equipment. Consultation and studies for the areas EMC, antennas and general application of computational electromagnetics. Special extensions to numerical EM software according to customer requirements.
AMETEK Compliance Test Solutions (CTS) is a leading provider of test and measurement instrumentation solutions for electromagnetic compatibility (EMC) testing, headquartered in Reinach/Switzerland, producing a broad range of conducted and radiated EMC compliance testing systems, RF and microwave amplifiers.

AMETEK Compliance Test Solutions (CTS) offers four strong product brands under one roof –EM TEST, IFI, MILMEGA and TESEQ. With these four brands united together, AMETEK CTS continues to lead the way in EMC innovation, quality and range of solutions as well as customer support.

AMETEK CTS serves a wide range of industries including automotive, consumer and industrial electronics, medical equipment, telecommunications, defense and avionics.

YOUR CONTACT:
AMETEK CTS Germany GmbH
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59174 Kamen, Deutschland
T +49 2307 26070-0
sales.cts.de@ametek.com
www.ametek-cts.com
info.cts.de@ametek.com
AM Technologies

AM Technologies is a Polish Company with a strategic focus in two key areas:

- Sales and support of Test Equipment and Systems delivered by world leading suppliers;
- Design and integration of custom test systems, measurement solutions, instrumentation and automation tools as well as software design and expert services.

The Company key success factor is the individual attitude to our clients combined with professional integrity, resulting from remarkable skills and experience of people creating our team. Over the years we build extensive relationships with telecommunication service providers, network equipment and other electronic manufacturers, educational and scientific institutions, military customers and government organizations.

AM Technologies was established in September 1999, as a result of Hewlett-Packard strategic realignment and Agilent Technologies spin-off. The HP Poland Test & Measurement Department was then transformed into AM Technologies - Agilent Technologies independent distributor for Poland. Since then the Company went through several changes and developments. Today AM Technologies product portfolio includes:

- Keysight Technologies general purpose instruments, RF and microwave test systems, telecommunication analyzers, research equipment for nanotechnology;
- Fluke Calibration instruments for electrical, temperature and pressure calibration;
- ETS Lindgren EMC and antenna test facilities;
- Cascade Microtech probing stations and AH Systems measurement antennas;
- VIAVI Solutions, IXIA, Keynote SIGOS telecommunication instruments and test solutions;
- SAAB Grintek, Sysdel and TCI special purpose measurement equipment;
- Consultancy, dedicated measurement software and custom systems.

The Company supports polish educational institutions and is a member of EMC Committee of Polish Academy of Science, as well as Support for Radiocommunication and Multimedia Development Foundation.


The Company aim is to enhance customer satisfaction through the continuous improvement of delivered products and services in full compliance with all regulatory requirements.

AM Technologies Sp. z o.o. Sp. k., Al. Jerozolimskie 146C, 02-305 Warszawa
tel. 22 532 28 00, faks 22 532 28 28, e-mail: info@amt.pl, www.amt.pl
Your Total EMC Source for Over 45 Years

1 to 2.5 GHz Solid State Amplifiers
The solid state alternative to TWTA's. Improved harmonics, lower noise, superior linearity and reliability, and now featuring 3,000 watts CW.

16,000 Watts of Pure Power
The new 16000A225 amp. It covers 10 kHz to 225 MHz and delivers 16,000 watts of power and we're not stopping there. Call us for power levels up to 50,000 watts.

"W" Series Amplifiers
The most advanced, highest power and most innovative RF Solid State amplifiers in the world. Now providing up to 10,000 Watts CW from 80 to 1000 MHz.

Precision DSP Receiver
This 18 GHz EMI receiver changes the way you think about emissions testing. Data is more accurate and test time is reduced. Available up to 40 GHz.

Integrated Test Systems
All-in-one test systems for any EMC application, DC to 50 GHz. Our systems make testing more efficient, accurate, and affordable.

Multi-Tone Tester
This incredible system cuts RF Radiated Immunity testing from days down to hours by testing multiple frequencies simultaneously, from 10 kHz to 6 GHz, reducing product development cost and time to market.

Field Analyzer
The new series of laser powered electric field analyzers have an extremely high sample rate and can precisely measure pulsed electric fields in the microsecond range.

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We build great products that last.

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The ASTAT company provides wide range of electromagnetic compatibility (EMC) solutions and it has been operating on this demanding market for over 20 years, sharing expertise and experience with its customers. Many years of presence where EMC is a must confirms we are specialists in areas such as:

Design, installation and commissioning of anechoic and reverberation chambers, GTEM cells and Faraday cages.

Professional supervision over the construction work is offered from the very beginning of the project in order to ensure that new or adapted building is fully compatible with construction of the chamber. Every project is based on specifics of future tests inside the chamber and on the nature of tested objects in full compliance with current standards. Advanced program for numerical simulation of the chamber verifies correctness of assumptions, such as: selection of absorbers, their location and number, or how door location affects chamber performance, even before assembly.

The result is an optimal conception of construction, made of materials of highest quality: shield + absorbers, quickly and perfectly assembled, ensuring great satisfaction of use. The final verification of entire investment are measurements performed by an independent, accredited laboratory, confirmed by positive test report.

Verification of shielded and anechoic installations in terms of compliance with both: civil and military standards.

Creating complete test stations by integrating measuring equipment compliant with particular standards.

Astat offers service of building new and developing existing EMC laboratories, and provides to the user complete turnkey test stations. The entire procedure is carried out in accordance to customer’s preferences and in full compliance with requirements of latest standards.

We provide technically advanced, most reliable and best on the market measuring instruments, software and laboratory equipment.
Along with the software customer is given a full control over measuring equipment, and unlimited possibility of upgrading it, and that all approved by professional test report.

Supply, commissioning and servicing of EMC appliances for testing civil and military equipment in terms of emission and immunity.

Comprehensive offer of filtering, shielding, sealing and absorbing EMI components for production.

Our goal is to not only supply EMI components, but also to consciously and carefully select most effective solutions. As a result, our customers receive perfectly matched product with a number of intangible but very important benefits. Thanks to well-featured machine park and highly qualified engineering personnel we are able to provide service of shielding, sealing and absorbing EMI components production. The priority is to supply the highest quality components in the shortest time.

Consulting services for prototype solutions and modifications of equipment in order to ensure compliance with EMC standards in our laboratory.

Innovative thermal conductive materials. Scanning PCBs and complete devices for emission and immunity check to identify sources of interference.

Service of automatic application of EMI sealing materials and conductive paint coating.

EMC trainings and courses.

As specialists in high voltage impulse technology since 1994, EMC PARTNER AG has built a reputation delivering innovative solutions for commercial and industrial EMC immunity testing, indirect lightning on aircraft and component testing for a worldwide customer base.

EMC PARTNER is continually expanding through new product lines and into new geographic areas. Based on our client's needs and the evolving market, EMC PARTNER design both traditional EMC impulse generators and impulse test systems for evolving technology such as smart grid and smart meters.

A team of qualified engineers enable us to provide competent advice, high quality reliable products and an efficient service for our customers. We employ a quality management structure based on ISO9001 which enables our company to obtain the status of an ISO17025 accredited calibration facility. All primary functions are maintained in-house with the benefit of a fast reaction time to meet market demands for updates to existing products or new developments.

Access to international markets is through a network of competent representatives, many having long associations with EMC PARTNER.

EMC PARTNER AG
Baselstrasse 160 – CH-4242 Laufen – Switzerland
ASTAT COMPANY PROFILE
ELECTROMAGNETIC COMPATIBILITY

ASTAT REPRESENTS

„Detectus AB is a Swedish company that develops, manufactures and sells EMC test systems directly and through distributors worldwide“.

For over 20 years our products have been developed in close contact with our customers which allows for flexible and easy-to-use products. In light of the high demands for electromagnetic compatibility that developers are facing, we are confident in our chosen strategic direction.

At Detectus, we’re dedicated to provide market leading EMC scanning technology to the electronics industry in general and the cell phone industry in particular. Our goal is to improve the search for emission sources for developers and electronic designers worldwide.

DETECTUS AB
S. Hantverkargatan 38 B – 782 34 Malung – Sweden

In the early 2000’s the founders of GAUSS INSTRUMENTS invented a measurement technology combining Time-Domain and FFT based techniques and superheterodyne technology in a massively parallel topology - the so called TDEMI® Technology, which is a registered brand and patented technology of GAUSS INSTRUMENTS and is only provided by GAUSS or its’ ofcial certifed local partners.

Ofcial testing and certifcation institutes as well as leading automotive OEMs and other blue chip companies selected GAUSS as cooperation partner and solution provider for their demanding test requirements during market certifcation as well as product development.

As an inventor of the TDEMI® Measurement System that uses ultra high-speed analog-to-digital converters and advanced real-time digital signal processing methods we enable ultra fast tests and measurements for electromagnetic compliance. Today GAUSS offers a wide range of solutions from DC to 40 GHz for all kind of test requirements in the world. We provide customized signal processing solutions based on our established well-proven hardwareplatforms and softwaresolutions. With a strong knowledge in real-time digital technology and millimeterwave and microwave technologies we develop systems that are absolutely outstanding in the field of test and measurement.

Fastest real-time FFT based technology with a full compliance real-time analysis bandwidth of 645 MHz as well as classical superheterodyne technology are only a few of our outperforming features for full compliance testing and analysis of EMI.

GAUSS INSTRUMENTS GmbH
Agnes-Pockels-Bogen 1 – 80992 München – Germany

ASTAT sp. z o.o.
ul. Dąbrowskiego 441 60-451 Poznań
tel. 61 848 88 71  fax 61 848 82 76
info@astat.pl  www.astat.pl
Newton4th Ltd (abbreviated to N4L) was established in 1997 to design, manufacture and support innovative electronic equipment to a world-wide market. Specialising in sophisticated test equipment, particularly related to phase measurement, our product portfolio includes Power Analyzers, Frequency Response Analyzers (gain/phase analyzers), Impedance Analyzers, Vector Voltmeters, Phase Meters, true RMS voltmeters, Selective Level Meters and Laboratory Power Amplifiers.

The company was founded on the principle of using latest technology and sophisticated analysis techniques in order to provide our customers with accurate, easy to use instruments at a lower price than has been traditionally associated with these types of measurements. Flexibility in our products and an attitude to providing the solutions that our customers really want has allowed us to develop many innovative functions in our ever increasing product range.

Newton4th Ltd are ISO9001 registered, the internationally recognised standard for the quality management of businesses. In recognition of the technical innovation and commercial success of the PPA series, N4L received the „Innovation 2010” Queen’s award for enterprise.

Montena is a Swiss company active in the field of electromagnetic compatibility since 1978. Montena designs and manufactures high voltage fast transient pulse generators and EMC test equipment. From development to installation, montena provides turnkey solutions for electromagnetic compatibility test systems compliant with MIL standards.

The product range includes:
- NEMP simulators according to MIL-STD-461 RS105,
- NEMP protecting device testing systems according to MIL-STD-188-125,
- UWB antennas,
- ESD 300kV test setup,
- Pulse electromagnetic field measurement equipment,
- and many other test systems and accessories for MIL standards testing.

Montena offers a comprehensive range of standard solutions, with the ability to develop and adapt to customers’ requirements.

Montena is the world leader for small to large sizes NEMP simulators according to MIL-STD-461 RS105 and for NEMP protector testing systems according to MIL-STD-188-125.

MONTENA TECHNOLOGY SA
Route de Montena 89 – 1728 Rossens – Switzerland

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Newton4th Ltd
1 Bede Island Road – Leicester – LE2 7EA

ASTAT COMPANY PROFILE
ELECTROMAGNETIC COMPATIBILITY

ASTAT REPRESENTS

WORLD LEADER FOR NEMP TEST SYSTEMS
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MONTENA TECHNOLOGY SA
Route de Montena 89 – 1728 Rossens – Switzerland

Newton4th Ltd
1 Bede Island Road – Leicester – LE2 7EA
ATDI is an international company that provides a wide range of software products specifically designed to meet the demands of Radio communication, Digital Cartography, Electronic Warfare and Spectrum Management.

Three decades in radio communication, software tools and engineers who have already overcome every challenge the industry can present. It makes ATDI the world’s leading authority on radio network planning and modelling, spectrum management, dynamic spectrum and network optimization. Network operators, spectrum regulators, military planners, emergency services, broadcasters and air traffic controllers can all rely on ATDI to handle the planning and modelling for their vital radio systems.

Hundreds of customers worldwide and offices in more than ten countries make ATDI the most comprehensive provider of radio planning solutions. ATDI is currently managing more than 15 spectrum management projects in 14 countries.

The company offers a wide range of studies and solutions supporting all wireless technologies, including PMR, WiMax, Broadcast, Mobile, Microwave, Satellite TV, Radars. ATDI is accredited with ISO 9001:2008 and ISO 27001:2005.
Founded in 1985, Comtest Engineering provides in-depth EMC test facility planning, engineering and installation services to customers on a worldwide basis.
Comtest has a flexible and professional organisation and the products are recognized for quality and performance.
Our experience has run the entire spectrum, from design of small shielded rooms through the construction of large Semi Anechoic EMC facilities for testing of satellites and automobiles.

From 1999 Comtest Engineering started with the in-house design and production of RF shielding. The Pan-Type shielding panels provide a modular concept using 2mm Steel panels covered with a special ZMA-140 coating. The unique parallel closing concept of our swing doors provide extended life time in line with the RF shielding. In 2012 Comtest started production of Polystyrene RF absorbers for use in EMC facilities as well as for applications in the Antenna Test Range. The modular construction of the RF Absorbers allows an efficient transport of the materials. After the installation of the separate baseplates, the pyramids can be installed easily. In case of damage, a pyramid can be replaced rather than a whole absorber. These Polystyrene RF absorbers meet ROHS and REACH requirements and have an expected life time of 40 Years. Comtest Engineering is ISO-9001 and ISO-14001 certified. These certificates are issued after a complete review and three days of auditing by Quality Masters, an official accredited registrar for the standard.

For further information, please visit:

http://www.comtest.eu

Comtest Engineering bv
Industrieweg 12
NL-2382NV Zoeterwoude
Tel: +31 715417531
Email: info@comtest.eu
Make the Connection

Find the simple way through complex EM systems with CST STUDIO SUITE

Components don’t exist in electromagnetic isolation. They influence their neighbors’ performance. They are affected by the enclosure or structure around them. They are susceptible to outside influences. With System Assembly and Modeling, CST STUDIO SUITE helps optimize component and system performance.

If you’re more interested in microwave components or signal integrity analysis, we’ve a wide range of worked application examples live on our website at www.cst.com/apps.

Get the big picture of what’s really going on. Ensure your product and components perform in the toughest of environments.

Choose CST STUDIO SUITE – Complete Technology for 3D EM.
EMCoS Simulation Tools
Simulation Has Never Been so Easy!

EMCoS focuses on generation of special simulation software. Powerful simulation tools and techniques lets solve complex EM problems in fast and efficient manner. EMCoS software is widely used in automotive, aircraft and naval industries. Application areas include: EMC / EMI in large systems, complex harness processing, solutions for hybrid vehicles, shielding study, antenna simulations, PCB simulations.

27 Pekin Str.
0160 Tbilisi
Georgia

Tel: +99532 238 9091
Fax: +99532 238 9092
info@emcos.com
www.emcos.com
We are an ISO 9001:2008 & ISO 14001:2005 certified industry in the micro sector, located in Bangalore, India, and specialized in the field of electromagnetic/radio frequency interference solutions. We manufacture a complete range of power line EMI/RFI filters in single and three phase (230 V, 440 V, 520 V, 690 V) and can offer filters with current ratings up to 2500 A.

We are manufacturing EMI/RFI power line filters, HEMP filters, feedthrough capacitors/filters, coaxial/EMP connectors, surge suppressors and lightning arrestor for various applications in:

1. Variable Frequency Drives (VFD)
2. Industrial Automation
3. Home Appliances
4. Military Electronics
5. UPS/Office Automation
6. Medical Electronics
7. Power Electronics
8. Solar & Wind Mill Applications

EMIS make filters are certified for export to all the major continents, Europe, USA & Canada with safety certification as per CSA22.2, UL 1283 and EN 60939.

This is the first time the EMI power line filters, facility filters and feedthrough capacitors/filters from India are available with all the major international safety certifications CSA / C-US and NEMKO with additional “CE” mark.

EMI Solutions Pvt. Ltd
#237-A5 Bommasandra Industrial Area, Hosur Road, India-560099 Bangalore
phone: +91 80 27836837 marketing@emisindia.com
fax: +91 80 27836880 www.emisindia.com
Freicomp GmbH was founded in 2003 by Thomas Müller, Dip. Eng. (FH), in Freiburg. The Company has since continued to grow and expand, not only in size but also internationally. In 2015, Freicomp GmbH moved to new premises within Ebringen, 5 km off Freiburg, which includes a warehouse with over 600 m², offices and a well-equipped test-lab. Our employees benefit from many years of experience in the development and marketing of passive components. The available know-how provided a very strong basis for the founding of this company and continues to be of great importance, today.

**Services**

- Trade and development for electrical products
- Distribution of components
- Technical advice
- Engineering services

**Products**

- EMI components, filters, chokes, capacitors
- Inductors, Transformers and other winding components

Development of services with different manufacturers globally. To accommodate our customer requirements, we work together with several manufacturers worldwide. We place great emphasis on ensuring that the product is in line with the manufacturer’s possibilities and are thus confident of providing a qualitative and cost-effective solution.

Please do not hesitate to contact us with any further questions.

We also invite you to visit our home page at www.freicomp.com
More than 20 years of experience in planning and realizing EMC test laboratories!

Turn-key solutions; from anechoic chambers to automatic EMC test systems for emission and immunity measurements

Established in 1987 Frankonia quickly developed to one of the worldwide leading manufacturer and supplier acting on the EMC (electromagnetic compatibility) market.

In the beginning Frankonia’s engineers and designer realized their innovative concept for the production of big anechoic chambers (semi-anechoic chambers and fully-anechoic chambers) and RF-shielded rooms.

Afterwards the development of a worldwide new absorber technology followed, which sets new standards till these days. With the so-called thin film technology we developed the first RF-absorber “FrankoSorb®” that fulfill the requirements of DIN 4102, class A2 (non-combustible) with highest RF-performance.

Frankonia is one of only a few suppliers, who manufacture all important shielding parts, e. g. doors and gates, honeycombs, water-, gas- and other feed-through components up to 40 GHz as well as RF-microwave absorbers by themself. All anechoic chambers and shielded rooms are delivered as a turn-key solution and are installed by our own assembly team. By request we carry out necessary measurements according to all common international standards for shielding attenuation, field-homogeneity and deviation of NSA and Site-VSWR. This will be realized either by skilled Frankonia staff using Frankonia’s calibrated test equipment or an independent certification authority.

Because of the increasing demand for turn-key EMC laboratories, we decided almost 20 years ago to expand our range of products to the additional delivery of EMC test systems. In the following years we completed our test equipment program with many own development projects as well as with cooperative projects.

Today we have a wide variety of EMC test systems such as immunity test systems e.g. for tests according to IEC/EN 61000–4–3 or IEC/EN 61000–4–6 and emission measuring systems. But we also offer single components like RF-power amplifiers, antennas, signal generators, RF-power meters and magnetic field test equipment.

It’s our philosophy to improve our products, to realize new ideas and to complete our product range in the EMC area. Therefore we have a big team of more than 240 employees as well as productions in Germany, Poland and China.
HELMAR was founded in 1999 as a representative of a number of companies. Distributes the measurement systems of well-known companies, such as:

Albatross Projects, Emerson&Cuming, HAEFELY-HIPOTRONICS, NARDA-PMM, PPS. Offered products are: EMC absorbers, EMC anechoic and shielded chamber, High-voltage testers, Receivers and Antennas, DC/AC power supplies. [www.helmar.com.pl](http://www.helmar.com.pl)

Branch Offices: Cracow  [zubrzak@helmar.com.pl](mailto:zubrzak@helmar.com.pl) and Poznan [jurkowski@helmar.com.pl](mailto:jurkowski@helmar.com.pl)
The Albatross Projects GmbH Group

Albatross Projects GmbH is a leading global system provider in RF solutions with around 170 employees at six locations in Heidenheim/Nattheim, Munich, Dallas/USA, Shanghai, India and Belgium. The company specializes in the development and worldwide installation of test facilities to check the electromagnetic compatibility of equipment and systems. An additional division of APG extends to shielding the test environment from RF interference generated by MRI scanners. Albatross Projects GmbH delivers turnkey solutions for all industries, including automotive, telecommunications, IT, medical, household equipment, military and other governmental agencies.

Albatross Projects GmbH
Daimlerstraße 17
89564 Nattheim, Germany
Phone: +49 7321 730 500
info@albatross-projects.com
www.albatross-projects.com

committed to excellent service
Zajmujemy się dostawami specjalizowanych urządzeń i systemów pomiarowych do testów elektrycznych, elektronicznych, radiowych, akustycznych i EMC, oraz zestawów edukacyjnych przeznaczonych dla wyższych uczelni i szkół średnich. Dostarczamy komory badawcze GTEM i komory ekranowane/bezodbcienne oraz wyposażenie laboratoryjne dla testów kompatybilności. Dla szkół wyższych o profilach technicznych, dla konstruktorów, nauczycieli i studentów dostarczamy zestawy sond pola bliskiego, miniaturowe namioty ekranowane oraz skanery do mapowania zakłóceń wytwarzanych przez układy elektroniczne.

W uzupełnieniu oferty znajdują się także mierniki, specjalizowane zasilacze testowe/arbitrary, oscyloskopy, generatory i inne wyposażenie laboratoriów elektronicznych, serwisowych i dla przemysłu. Dla laboratoriów pomiarowych i operatorów sieci komputerowych dostarczamy generatory częstotliwości wzorcowej oraz przyrządy do diagnostyki i monitorowania sieci. Dla telekomunikacji dostarczamy testery sieci, podzespoły mikrofalowe, przyrządy dla budowy i konserwacji sieci światłowodowych i miedzianych, mierniki TV (DVB), testery stopy błędów szybkiej transmisji danych BER i systemy monitorowania jakości usług QoS, VoIP, IPTV, oraz łącze dostępowych. Współpracujemy z czołowymi producentami sprzętu o specjalnym przeznaczeniu takiego jak: rejestratory audio i wideo, ekranowanie, absorbery elektromagnetyczne, analizatory i odbiorniki sygnałów radiowych, wykrywacze materiałów niebezpiecznych, wykrywacze obecności ludzi za ścianą i inne.

Dla naszych klientów organizujemy regularne seminaria i szkolenia dotyczące produktów, technologii i ich wykorzystania.

ENGLISH

Our company is specialized in technical - commercial deliveries of specialized measuring instruments and systems for electrical, electronic, radio, acoustic and EMC tests. We deliver GTEM cells and shielded rooms / anechoic chambers with additional laboratory equipment for electromagnetic compatibility testing. For technical high schools, designers, teachers and students we provide near field probes, miniaturised shielded tents and scanners for EM disturbances mapping.

For educational centers we deliver training equipment for students laboratories, together with other measuring instruments like specialized power supplies / arbitrary power supplies, oscilloscopes, generators. For measuring and calibration laboratories we deliver frequency and time standards and signal distribution equipment. For telecommunication area we provide network testers, microwave components, instruments for building and maintenance of fibre and copper networks and high speed BER transmission testers, TV network testers (DVB), as well as instruments and systems for network diagnostics, QoS, VoIP, IPTV monitoring and access line testing. We do cooperate with manufacturers of the best equipment for special tasks: audio/video recorders, shielding solutions, electromagnetic absorbers, radio surveillance and antenna systems, behind the wall human detectors and other.

For our customers we organize regular seminars and training for better product and technology understanding and use.

**Hik-Consulting**

Chabrowa 16, 01-934 Warszawa
tel: +48 696 930 859
fax: +48 22 864 9908

www.hik-consulting.pl
www.hik-consulting.pl/shop
www.hik-consulting/edu
The KABELKOM’s Testing Laboratory is accredited by the Polish Center for Accreditation (www.pca.gov.pl, accreditation No. AB 1149). The scope of our accreditation is unique in Europe and comprises leakage measurements of cable TV networks (based on EN 50083-8) and stationary/mobile propagation measurements (E field intensity based on ITU-R SM.378-7, ITU-R SM.1708, CEPT/ERC/REC (00)08) of radio transmitters for various radio communication systems (e.g. DVB-T/H, DAB, FM radio, TETRA, P.25).

We can gather and process (the Lee method) the data for propagation model tuning. The Laboratory can prepare and perform any experimental measurement campaign or tests of any new radio communication system. We offer the interpretation of the results leading to the improvement of network coverage/service quality. The measurement results are visualized on maps (satellite, paper tourist maps, GIS systems) in the formats required by a customer. We can also design and verify radio communication systems (including coverage simulation).

The Laboratory cooperates with technical universities and research institutes. Our staff is well-qualified and experienced in measurements, design and deployment of radio communication and cable TV systems. We have modern equipment - two specialized measurement vehicles with 10 m masts and automatic measurement systems for mobile leakage and propagation measurements.

The Laboratory has done propagation and leakage measurements for many companies (e.g., MOTOROLA, UPC, FM radio operators) in the following countries: Austria, France, Switzerland, Portugal, Ireland, Germany, Slovakia, Slovenia, Lithuania, Latvia, Norway, Holland, Hungary, the Czech Republic, Poland.
LUMILOOP develops and markets ready to use optically powered systems. Power-over-fiber is an attractive option in electromagnetically sensitive environments, particularly for long-term, maintenance-free applications. It can deliver uninterrupted power sufficient for elaborate sensors, data processing or even actuators alongside continuous high speed data communication for remote sensor application.

LUMILOOP has launched the LSProbe 1.2 that offers a significant reduction in measurement time and effort for radiation immunity testing. Continuous streaming of 500,000 samples per second provides precise timing and characteristics of the electric field strength in reverberation chambers and multiple probes can measure synchronously.

From 10 kHz to 6 GHz the LSProbe 1.2 delivers best-in-class dynamic range (70 to 100 dB) for electric field strengths from 0.1 V/m to 10 kV/m. Extensive frequency and temperature compensation data is supplied for each probe.
Since 2008, Microwave Vision Group has combined the technological expertise, product portfolios and infrastructures of four industry leaders: SATIMO, ORBIT/FR, AEMI and Rainford EMC Systems who have joined forces to provide a wide variety of products and solutions for Antenna Measurements and Electro-Magnetic Compatibility (EMC) Testing.

For EMC Solutions we design, manufacture, supply and install shielded enclosures, anechoic chambers, shielded doors, absorbers and more. Through our partnership with Amplifier Research (AR), we can provide exceptional turnkey solutions for the most demanding EMC requirements.

With revenue of Euros 60 million (2015) and 19 years continual growth, MVG is now present in 10 countries with 23 sites. Our 350 employees worldwide are driving Microwave Vision Group’s technical success through continual innovation.

Contact your local sales representative for more information
www.mvg-world.com/emc
salessteam@mvg-world.com
Firma NDN powstała w 1988 roku i zajmuje się dystrybucją, kalibracją oraz naprawami przyrządów kontrolno-pomiarowych.

Jesteśmy dystrybutorami następujących firm: AARONIA AG, AI TELONG, APPA, ARRAY, AT TÉN, BK PRECISION, BREVE, BST, CEM, CHAUVIN ARNOUX, CHROMA, CREDIX, ELABO, ERA, ESCORT, FINEST, FLEX, FLUKE, GO5CAM, GW INSTEK, HAMEG, HANTEK, HERA, IDRC, IRODA, ITECH, K & H, LANGLOIS, LEAPTRONIX, LUTRON, MCP, METEX, MICROMADE, MIC, MOTECH, ORANGE PI, PCE, PEARSON, PICOTEST, PI TÉK, PRECASTER, PROMAX, PROTEK, RIGOL, ROHDE & SCHWARZ, S.EA.D.A., SANWA, 5 AT LNK, SEW, SIGLENT, SONEL, T ELEDYNE LECROY, TESTEC, TONGHUI, ULI RVISION, VIKING, WENS, WOPSON, XYTRONIC, YOKOGAWA, ZELAP, ZERO PLUS

Oferujemy największy wybór: przyrządów dla elektroinstalatorów i energetyki, multimetrów cyfrowych i analogowych, mostków RLC, mierników cęgowych i izolacji, oscyloskopów, zasilaczy, generatorów, tachometrów, luksomierzy, mierników i regulatorów temperatury, testerów telekomunikacyjnych, testerów ISDN, przyrządów do TV i SAT, sprzętu lutowniczego, przemysłowych przyrządów pomiarowych i przetworników, mierników wielkości nieelektrycznych oraz aparatury specjalizowanej.

Prowadzimy autoryzowany przez producentów serwis aparatury, wykonujemy kalibrację (kalibratory FLUKE), wystawiamy świadectwa sprawdzenia.
Rohde & Schwarz

The Rohde & Schwarz electronics group offers innovative solutions in the following business fields: test and measurement, broadcast and media, cybersecurity, secure communications, radiomonitoring and radiolocation. Founded more than 80 years ago, this independent company has an extensive sales and service network and is present in more than 70 countries. The electronics group is the world’s leading manufacturer of wireless communications and EMC test and measurement equipment.

Rohde & Schwarz offers an exceptional range of EMC and field strength test equipment, from standalone instruments to customized turnkey test chambers.

The EMI and EMS test instruments and systems determine the causes and effects of electromagnetic interference and ensure compliance with the relevant EMC standard. The EMC test solutions support all relevant commercial, automotive, military and aerospace standards as well as ETSI and FCC standards for radiated spurious emissions and audio breakthrough measurements.

EMC solutions from Rohde & Schwarz:
www.rohde-schwarz.com/ad/emc

Scan contact info:
Tespol Sp. z o. o. jest działającą od 25 lat polską firmą, będącą autoryzowanym przedstawicielem czołowych producentów aparatury kontrolno – pomiarowej oraz systemów radiokomunikacyjnych. Zapewniamy kompleksową ofertę produktów oraz usług w zakresie najnowocześniejszych technologii i systemów pomiarowych, łączności oraz nadajników RTV następujących producentów, z którymi związani jesteśmy wieloletnimi umowami serwisowymi i dystrybutorskimi: Tektronix, Rohde&Schwarz, Fluke, Keithley, Spectracom, Sonel, LitePoint, MVG, ABI Dewetron, Magna-Power oraz CST.


Firma Tespol gwarantuje pełną obsługę wdrożonych i dostarczonych rozwiązań w zakresie wsparcia technicznego, autoryzowanego serwisu reprezentowanych firm, kalibracji aparatury pomiarowej oraz szkoleń.
Since launching our range of compact, lightweight broadband TWT amplifiers in the early 1990s, TMD has been very successful in supplying products for EMC applications worldwide. These products have evolved and benefited from our expertise in high power military radar amplifiers. TMD’s standard amplifier range covers 1 – 40 GHz at up to 1000 W CW and 40 kW pulsed and has gained a worldwide reputation for design innovation; including many unusual, high performance products.

BRAND NEW PTCM Series

TMD is pleased to release a brand new range of high power Travelling Wave Tube RF Amplifiers offering improved user interface and maintainability. User applications include EMC / Radiated Immunity testing, Communications, EW, Radar, RF Component Testing and Scientific applications.

TMD Technologies Ltd.
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Welcome to EMC EUROPE 2017

Angers, France

On behalf of the International Steering Committee, I am delighted and privileged to welcome you and your families to the major European conference on EMC, from 4 to 7 September in Angers, one of the best cities of good living in France.

Angers, located in the Loire Valley (1.5 hour from Paris by train), is classified by UNESCO as a World Heritage for Humanity. For many centuries, it has evolved from an ancient city into a flagship of modern technology, receiving the FrenchTech label for its contribution to the Internet of Things while keeping its traditional character.

EMC Europe 2017 focuses on the high quality of scientific and technical contributions as well as the fruitfulness of exchanges among EMC researchers and practitioners from all over the world, in a spirit of openness and conviviality. The conference will cover the whole spectrum of EMC topics, including emerging trends. Special sessions, workshops, tutorials and a large exhibition will be organized along with regular sessions.

Angers is a place where the ‘French way of life’ expression takes on its full meaning. From castles to wine-tasting, from sightseeing to good food, you will not be disappointed with your stay.

Join us in EMC Europe 2017 for an experience you will never forget!

Mohamed Ramdani
Conference Chair

Important Dates

Proposals Deadline: 15 February 2017
Notification of Acceptance: 17 April 2017
Final Submission Deadline: 15 May 2017
Reduced Fee Registration Deadline: 15 May 2017
Conference: 4 to 8 September 2017

Call for Special Sessions

Special Sessions focus on areas of interest not addressed in Technical Papers. Acceptance criteria are the same as for Technical Papers. Please send proposals for special session to the Conference Chair, Mohamed Ramdani (mohamed.ramdani@emceurope2017.org) before March 15, 2017. Proposals for special sessions must contain the following information:
- Title of the special session
- Description of special session
- Name of the chair with full contact information
- Chairperson(s)
- List of potential authors/presenters and papers

Venue

EMC EUROPE 2017 will take place in ESEO Graduate School of Engineering, Angers, France.

ESEO is located approximately 2.5 km from the city centre (15 minutes by tram).

Angers is a beautiful medieval city, with many places to visit in and around (castles, churches, wineries…). Do not hesitate to extend your stay.

Call for Workshops and Tutorials

Workshops and Tutorials are informal, interactive educational presentations, often addressing practical issues encountered in the lab. Workshops and tutorials are scheduled for one-half day or full day. For proposals that are accepted, the workshop or tutorial organizer will be responsible for soliciting presentations, coordinating reviews, corresponding with session speakers, ensuring deadlines are met by all their speakers, corresponding with the symposium Local Committee, and moderating the session at the symposium. Please send proposals for workshops or tutorials to the Conference Chair, Mohamed Ramdani (mohamed.ramdani@emceurope2017.org) or upload them to the on-line conference system before March 15, 2017. Proposals for workshops or tutorials must contain the following information:
- Title of workshop or tutorial
- Format: Workshop or Tutorial
- Name of Workshop/Tutorial chair with full contact information, including company/affiliation name, address, telephone number, and e-mail address
- Description of workshop/tutorial, including objectives, content and novelty
- Description of topics
- List of potential authors/presenters

Local Organising Committee

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