16th International Zurich Symposium on Electromagnetic Compatibility

EMC Zurich 2005

EMC Zurich 2005

February 13 – 18 Zurich, Switzerland
www.emczurich.ch

Technical Exhibition on EMC and RF/Microwave Measurements & Instrumentation

Organized by

Laboratory for Electromagnetic Fields and Microwave Electronics

ETH

Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

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Special Events, Tutorials and Workshops

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Finances

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Publications

Klaus Krohne and Aldo Rossi:
Computers

Raimondo Ballisti:
Website and e-mail

R. Danieli:
Social Events

Dr. Christophe Fumeaux and Dirk Baumann:
Local Arrangements

Conference Administration

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Speakers Attention

All authors have the opportunity to meet their session chair prior to their presentation.

Meet your session chair and get your "speakers present" in the "Symposium Officers Lounge", room G 60, at the following times:

Tue morning sessions:	09:30 sharp
Tue afternoon sessions:	13:30 sharp
Wed morning sessions:	08:30 sharp
Wed afternoon sessions:	14:15 sharp
Thu morning sessions:	08:30 sharp
Thu afternoon sessions:	13:30 sharp

For details on projection, video projector, slides etc. please refer to the speakers instruction sheet, available at the information desk.

Symposium Program EMC Zurich

*: Speaker
SC: Student Contest

Tuesday, February 15, 2005

9:00 – 10:30 **Opening Ceremony** Room Audimax

Keynote speech: *„EMC Paints the Lane Marks on the Wireless Information Superhighway" by Mike Marcus, Visiting Researcher at école Nationale Supérieure des Télécommunications.*

11:00 – 12:10 **Session 1:** Room F1

Broadband Powerline Communications [BPC]

Chair: Mike Marcus

Technical considerations for broadband powerline (BPL) communication: *Robert G. Olsen*: Washington State University, USA*

SC **Sensitivity of a short-wave receiving station regarding PLC transmission:** *Sven Battermann*, Heyno Garbe: University of Hannover, Germany*

Effects of broadband over power line communication systems on aeronautical HF-services: *Frank Sabath: Federal Armed Forces Research Institute for Protective Technologies and NBC Protection, Munster, Germany; Lawrence Steven Cohen*, Edmond Tomas: US Naval Research Laboratory, Washington DC, USA*

11:00 – 12:30 **Session 2:** Room E7

EMC in Communications [Com]

Chair: Pascal Leuchtmann

Higher-order effects of radiated interference - future challenging research domains within EMC in dynamic wireless communication networks: *Peter F. Stenumgaard*: Swedish Defence Research Agency; Leif Junholm: Swedish Defence Materiel Administration*

SC **Bandwidth conversion of the amplitude probability distribution for emission requirements of pulse modulated interference:** *Kia Wiklundh*: Swedish Defence Research Agency, Sweden*

SC **Immunity of bluetooth-transmitters against interfering electromagnetic fields with high field-strengths:** *Adrien Schoof*, Jan Luiken ter Haseborg: Hamburg University of Technology, Germany*

Electromagnetic emission of xDSL systems transmitted on twisted copper pairs: *Fahd Hassoun: Blaise Pascal University (Clermont-Ferrand), France; Ahmed Zeddam, Rabah Tarafi, J.-M. Debraux: France Télécom*

11:00 – 12:30 **Session 3:** Room F7

Reverberation Chambers and TEM Cells [Rev]

Chair: Heyno Garbe

Parameter estimates for the stirrer efficiency in reverberation chambers: *Niklas Wellander*, Olof Lundén, Mats Bäckström: Swedish Defence Research Agency, Sweden*

SC **Mode perturbation induced by the stirrer rotation in a reverberating chamber:** *Gerard Orjubin*, Elodie Richalot, Stephanie Mengue, Odile Picon: Université de Marne la Vallée, France*

The influence of stirrer size and chamber load on the number of uncorrelated samples created in a reverberation chamber: *Magnus Otterskog*: Örebro University, Sweden*

SC **Modeling coupling phenomena between septum and loop at low frequency:** *Aubry Picard*, François Fouquet, Anne Louis, Belahcène Mazari: IRSEEM-ESIGELEC, Rouen, France; Olivier Maurice: EADS, France; Bernard Demoulin: IEMN-TELICE, Lille, France*

11:00 – 12:10

Session 4: *Room F3*

Miscellaneous [Misc]

Chair: **Armin Kälin**

Band ratio and frequency-domain norms: *Carl E. Baum*, Air Force Research Laboratory, USA; Daniel H Nitsch, German Armed Forces Institute for Protective Technologies, Münster, Germany*

Managing EMC and safety compliance for telecommunication products: *Subramanian Chidambaram*: Hewlett Packard, Singapore*

Distribution of levels of intrasystem electromagnetic interference in systems of co-located radio equipment: *Mikalai I. Azamatov: Defence Industry Committee of the Republic of Belarus; Uladzimir I. Valoshyn*, Yury I. Masiyenka: Agat State Research and Production Association, Minsk, Belarus*

Experimental and theoretical studies of the Schumann resonance magnetic polarization in the gyrotropic earth-ionosphere cavity: *Vladimir G. Bezrodny*, Oleg V. Budanov, Alexandr V. Koloskov, Yury M. Yampolski: Institute of Radio Astronomy, Ukraine*

CANCELLED

14:00 – 16:30

Session 5: *Room F1*

History of EMC [Hist]

Chair: **Rüdiger Vahldieck**

A general history of the evolution of the discipline of EMC: *Daniel D. Hoolihan*, Hoolihan EMC Consulting, USA; Nigel Carter, QinetiQ, UK*

Three decades of EMC Zurich and the impacts of a changing environment: *Peter E. Leuthold*: Communication Technology Laboratory, ETH Zurich, Switzerland*

A history of the evolution of EMC regulatory bodies and standards: *Donald Heirman*, New Jersey, USA; Manfred Stecher, Rohde and Schwarz, Germany*

A brief history of EMC Education: *Todd Hubing, University of Missouri Rolla, USA; Antonio Orlandi: University of L'Aquila, Italy*

14:00 – 17:10

Session 6: *Room E7*

Automotive EMC [Auto]

Chair: **Robert Weigel**

Simulating the electromagnetic susceptibility of automotive vehicles in their early design stage: *Frédéric Bocquet: RENAULT Research Center, France; Jean-Claude Kedzia*: ESI Group, Rungis, France*

Harness influence in bulk current injection testing: *Frédéric Lafon*, Laurent Caves, VALEO EMC Departement, Créteil, France; François De-daran: VALEO, Center of electronic expertise, Créteil, France*

Periodic frequency modulation applied to noise cancellation between power and communication buses: *Alfonso Santolaria, David Gonzalez, Javier Gago, Josep Balcells: Universitat Politècnica de Catalunya, Spain; Stephane Brehaut, Jean-Charles Le Bunetel, Didier Magnon: Université François Rabelais, Tours , France*

Investigation of automotive emissions measurement frequencies, test methods and operating modes: *Alastair R. Ruddle*: MIRA Limited, Warks, UK*

SC **Application of geometry based strategies in the development of EMC-conformable motors in the automotive industry:** *Linh-Thao Stubenbord*, Claus Schmiederer: Robert Bosch GmbH, Germany*

SC **Influence of the PCB traces of an automotive electronic equipment in the case of random cable harnesses:** *Stephane Egot*, Marco Klingler: PSA Peugeot Citroën, France; Lamine Kone, Sylvie Baranowski, Bernard Demoulin: Université des Sciences et Technologies de Lille, France*

Application of adaptive scheme for the method of moments in automotive EMC problems: *Roman Jobava*, Faik Bogdanov, Anna Gheonjian: EMCoS, Tbilisi, Georgia; Stephan Frei: AUDI AG, Ingolstadt, Germany*

14:00 – 16:50

Session 7: Room F7
Bioelectromagnetics [Bio]

Chair

Michal Okoniewski

SC

Spectral analysis of simulated currents for the study of the interaction between electromagnetic fields and cellular ionic channels: *Alessandra Paffi*, Giuseppe Cotignola, Micaela Liberti, Francesca Apollonio, Guglielmo D'Inzeo: „La Sapienza" University of Rome, Italy*

MSRC measurements of high frequency non ionizing electromagnetic radiations (NIR) on living organisms: *David Roux*, Alain Vian, Pascale Goupil, Gérard Ledoigt, Sébastien Girard, Françoise Paladian, Pierre Bonnet: Blaise Pascal University (Clermont-Ferrand II), France*

Modelling electromagnetic field exposure and SAR in vehicles due to on-board transmitters: *Alastair R. Ruddle*: MIRA Limited, Warks, UK*

The estimation of the maximum SAR with respect to various types of wireless device usage: *Teruo Onishi*, Takahiro Iyama, Shinji Uebayashi: NTT DoCoMo, Inc., Japan*

SC

FDTD analysis of SAR from a cell phone inside a vehicle: *Gabriel Anzaldi*: Technical Superior School, Buenos Aires, Argentina, Eduard Canela, Pere Riu, Ferran Silva: Technical University of Catalonia, Spain*

The SAR evaluation method with optical fiber thermometer: *Yoshinobu Okano*, Youji Sugama, Minoru Abe: Musashi Institute of Technology, Tokyo, Japan*

09:00 – 12:30

Session 8: Room F1
Sensors and Antennas [Sens]

Chair

Jan Luiken ter Haseborg

Time domain characteristics of resistively-loaded electric field sensors: *James McLean*: TDK R&D Corp., Texas, USA; Heinrich Foltz, Robert Sutton: The University of Texas – Pan Am, USA*

Comparison between three antenna method and measuring impedance method for the antenna factor of a small half loop antenna: *Masanori Ishii*, Koji Komiyama: National Institute of Advanced Industrial Science and Technology, National Metrology Institute of Japan*

SC

A novel indirect method to determine the radiation impedance of an unknown antenna structure: *Jari O. Jekkonen*: NOKIA Corporation, Finland; Ian D. Flintoft, Myles H. Capstick, Andrew C. Marvin: University of York, UK*

Analyzing the coupling principles of radiated immunity tests for automotive components in the UHF-band: *Bernd Koerber*, Dieter Sperling: Zwickau University of Applied Sciences, Germany; Karl-Heinz Gonschorek, Dresden University of Technology, Germany*

Calibration of small antennas in a GTEM cell: *Claudio Piutti, Marco Falda, Alessandro Giardina: TESEO S.p.A., Druento (Torino), Italy; Michele Borsero*, Giuseppe Vizio: IEN Galileo Ferraris, Torino, Italy; Ernesto Arri: Polytechnic of Turin, Italy*

Quasi free-space antenna calibration in anechoic room: *Frédéric Conrad Pythoud*: Swiss Federal Office of Metrology and Accreditation, Switzerland*

Requirement to input impedance of common mode absorbing device: *Peter Mosshammer*: emc GmbH, Traufkirchen, Germany; Lutz Dunker: Regulierungsbehörde für Telekommunikation und Post, Berlin, Germany*

SC

The dynamic range of a time-domain EMI measurement system using several parallel analog to digital converters: *Stephan Maximilian Braun*, Peter Russer: Technische Universität München, Germany*

09:00 – 12:10

Session 9: Room E7
Lightning and its Effects I [Light1]

Chair

Vladimir A. Rakov

Simple model of repeating lightning-leader pulses: *Carl E. Baum*, Air Force Research Laboratory, USA*

SC

Incorporation of distributed capacitive loads in the antenna theory model of lightning return stroke: *Siamak Bonyadi-ram*, Rouzbeh Moini, Seyed Hossein Sadeghi: Amirkabir University of Technology, Tehran, Iran; Vladimir Rakov: University of Florida, USA*

Influence of lightning channel tortuousity and branches on a magnetic field distribution: *Grzegorz Maslowski*: Rrzeszow University of Technology, Poland*

Time-frequency resolution of the electric field radiated from a lightning discharge: *Stefano Marchi*, Riccardo Enrico Zich: Politecnico di Milano,Italy*

A method approach for lightning return stroke characterization: *Joan Montanya*, Pedro Rodriguez, David Romero: Technological University of Catalonia, Spain; Blas Hermoso: Public University of Navarre, Spain; Angel Illa: INGESCO, Terrassa (Barcelona), Spain*

The temporal characteristics of leader fields at ground level when a part of the lightning channel is inclined: *Chandima Gomes*: University of Colombo, Sri Lanka; Vernon Cooray: Uppsala University, Sweden*

Finite difference analyses of Schumann resonance and reconstruction of lightning distribution: *Yoshiaki Ando*, Masashi Hayakawa: The University of Electro-Communications, Tokyo, Japan*

09:00 – 12:30

Session 10: Room F7
Chip Level EMC (invited) [Chip]

Chair

Albert Rühli

SC

Single summation expression for the rectangular power ground plane cavity: *Joe Trinkle*: University of Western Australia; Antonio Cantoni: Western Australian Telecommunications Research Institute*

SC

The impact of decoupling capacitors on the impedance of rectangular PCB power-bus structures: *Matthias Hampe*, Stefan Dickmann: Helmut-Schmidt-University, Hamburg, Germany*

SC

Impedance analysis of power ground planes loaded with multiple capacitors: *Joe Trinkle*: University of Western Australia; Antonio Cantoni: Western Australian Telecommunications Research Institute*

Mixed volume and surface PEEC circuit and electromagnetic solver: *Albert E. Ruehli*: IBM Research Division, Yorktown Heights, USA; Dipanjan Gope, Vikram Jandhyala: University of Washington, Seattle, USA*

SC

Parasitic extraction and simulation of simultaneous switching noise in on-chip power distribution networks: *Subramanian N. Lalgudi, Jifeng Mao, Madhavan Swaminathan: Georgia Institute of Technology, Atlanta, USA*

PCB interconnects characterization from S-parameter measurements: *Vittorio Ricchiuti*: Siemens CNX S.p.A., Italy; Antonio Orlandi, Giulio Antonini: Univ. of L'Aquila, Italy*

Analog and mixed-signal simulation of EMC at system level: *Flavio G. Canavero*, Stefano Grivet-Talocia, Ivano A. Maio, Igor Simone Stievano: Politecnico di Torino, Italy*

Adaptive broadband macromodeling of passive high-speed components using vector fitting: *Tom Dhaene*: University of Antwerp, Belgium*

14:45 – 17:30

Session 11: *Room F1*

EMC Innovation [Innov]

Chair Antonio Orlandi

Source identification of electromagnetic radiation in electronic circuits using artificial neural network: *Kraison Aunchaleevarapan: Electrical and Electronic Products testing center, Bangkok, Thailand; Sathit Intrajak*, Werachate Khan-Ngern, Yothin Preampaneerach: King Mongkut's Institute of Technology, Thailand; Prasit Teekaput: Chulalongkorn University, Thailand; Shuichi Nitta: Salasiean Polytechnic, Tokyo, Japan*

SC **2mm industrial connector modeling with EM-ANN and polynomial description:** *Arnaud Argouarch*, Gérard Levanic: Thales Airborne System, Brest France; Mhamed Drissi: IETR CNRS UMR Rennes, France*

Experimental study of thermal influence on EMC emissions of digital circuit on PCB: *Jean-marc Dienot*: LESIA/ IUT Tarbes, France; Lourdel Guillaume: PEARL/ALSTOM, France*

SC **Influence of the short-channel effects in HEMTs on EMC characteristics of the HEMT-based amplifier:** *Igor V. Khrebtov*, Anatoly M. Bobreshov: Voronezh State University, Russia*

A universal method for setting up macromodels from frequency response of devices: *Nikolay Korovkin*, T. Minevich: State Polytechnic University, St. Petersburg, Russia*

A new broadband double ridge guide horn with improved radiation pattern for electromagnetic compatability testing: *Vicente Rodriguez*: ETS-Lindgren, USA*

14:45 – 17:10

Session 12: *Room E7*

Lightning and its effects II [Light2]

Chair Riccardo Zich

The performance of charge transfer system against lightning rod at the communication towers analyzed by using lightning video system and Rogowski coils: *Annuar Ramli, Nurul Idris, Baharin Shariff, Telekom Research & Development Sdn Bhd, Malaysia*

A novel model for lightning induced current computation: *Afef E. Slama*: Villanova University, USA; Jack Nachamkin: Boeing Company, USA*

SC **A wavelet based classifier for classification of cloud-to-ground lightning strokes:** *Keyhan Sheshyekani, Paria Sattari, Aryan Nicoomanesh, Hossein Sadeghi*, Rouzbeh Moini: University of Technology, Tehran, Iran*

Electromagnetic radiated field by a direct lightning stroke on an aircraft model: *Edoardo Alfassio Grimaldi*, Morris Brenna, Fulvio Martinelli, Riccardo Enrico Zich: Politecnico di Milano, Italy*

Model variations of global lightning activity derived from the optical transient detector data: *Alexander P. Nickolaenko*: Ukrainian National Academy of Sciences, Kharkov, Ukraine; Olga Pechony, Colin Price: Tel Aviv University, Israel; Gabriella Satori: Hungarian Academy of Sciences, Hungary*

14:45 – 17:30

Session 13: *Room F7*

Chip and Package Level EMC [ChiPa]

Chair Giulio Antonini

A modal transmission technique providing a large reduction of crosstalk and echo: *Frédéric Broydé*, Evelyne Clavelier: Excem, Maule, France*

Accurate identification long interconnects with the generalized method of characteristics: *Massimiliano de Magistris, L. De Tommasi, G. Miano: Università di Napoli Federico II, Italy; A. Maffucci: Università di Cassino, Italy*

SC **Using ICEM models for substrate noise:** *Olivier Valorge*, Pierre Dautriche:STMicroelectronics, Grenoble, France; Bertrand Vrignon: STMicroelectronics, Crolles, France; Cristian Andrei, Francis Calmon, Christian Gontrand, Jacques Verdier: LPM INSA Lyon, Villeurbanne, France*

SC **Assessment of resonance properties of electrically small PCBs via radar cross-section measurements in a GTEM cell:** *David Pouhè*, Gerhard Mönich, Wilfried Fami Kemi: Technical University Berlin, Germany*

Analysis of the effect of radio frequency interference on the DC performance of operational amplifiers: *Muhammad Taher Abuelmaatti*: King Fahd University of Petroleum and Minerals, Saudi Arabia*

SC **A PLL-based clock generator with improved EMC:** *Fabio Pareschi*, Luca Antonio De Michele, Riccardo Rovatti, Gianluca Setti: University of Bologna, Italy and University of Ferrara, Italy*

Thursday, February 17, 2005

09:00 – 10:30

Session 14: Room F1
HEMP Effects (invited) [Hemp]

Chair **William Radasky**

The effects of HEMP and UWB pulses on complex computer systems: *Daniel Nitsch, Andre Bausen, Jörg Maack: Research Institute for Protective Technologies, Münster, Germany; Roland Krzikalla*, Technical University of Hamburg-Harburg, Germany*

Fast pulse testing of power system control equipment to determine their susceptibility to HEMP conducted transients: *Edward Savage*, Kenneth Smith, Michael Madrid, James Gilbert, William Radasky: Metatech Corporation, Goleta, California USA*

Simulator test results of the withstand of distribution class insulators to steep-front/short duration (SFSD) impulses to simulate the early-time HEMP: *John G. Kappenman*: Metatech Corporation, Duluth (MN), USA; William A. Radasky: Metatech Corporation, Goleta (CA), USA; Stan Grzybowski, Y Song: Mississippi State University (MS), USA*

Research of power line insulator flashover due to the joint effect of a high voltage disturbance and line operating voltage: *A. Kozlov, S. Louzganov, Yu. Parfenov, M. Povareshkin, V. Polischouk, A. Shurupov, L. Zdoukhov: Institute for High Energy Densities, Moscow, Russia; William Radasky: Metatech Corporation, Goleta, California USA*

09:00 – 10:30

Session 15: Room E7
Emission Testing [EmT]

Chair **Karl-Heinz Gonschorek**

SC **A study and improvement of open-ended coaxial probe used for near-field measurements:** *David Baudry*, Anne Louis, Bélahcène Mazari: IRSEEM, Technopôle du Madrillet, France*

SC **Complex deconvolution for improvement of standard monopole in near-field measurement results:** *Adam Tankielun*: University of Paderborn, Germany; Uwe Keller, Werner John: Fraunhofer Institute for Reliability and Microintegration, Germany; Heyno Garbe: University of Hanover, Germany*

Multi-purpose anechoic chambers - EMC (SAR/FAR) to antenna measurements: *Martin A.K. Wiles*: ETS-Lindgren, UK; Alexander Kriz: ARC Seibersdorf Research GmbH, Austria*

SC

How to test emissions of really big machines. Investigations to improve the test wire method: *Karl-Heinz Gonschorek, Samuel Hochauf*: Dresden University of Technology, Germany; Franz Schlagenhaufer: The University of Western Australia*

09:00 – 12:30

Session 16: Room F7

Computational Electromagnetics I [Comp1]

Chair

Daniel de Zutter

SC

EMC relevant arrangements - a combination of MoM and GMT: *Stefan Balling*, Dirk Plettemeier, Karl-Heinz Gonschorek: Technical University of Dresden, Germany*

A partitioned MoM scheme for treating EMC problems on a series of geometries with a predominant common part: *Faik G. Bogdanov, Roman Jobava*, Paata Tsereteli: EMCoS, Tbilisi, Georgia; Stephan Frei: AUDI AG, Ingolstadt, Germany*

SC

Geometrical optimization embedded in the method of moments: *Natalie Baganz, Dirk Plettemeier, Karl-Heinz Gonschorek: Dresden University of Technology, Germany*

SC

Combined-node moment method analysis of through hole vias: *Reza Sabbagh Amirkhizi*, Hermann Singer: Hamburg University of Technology, Germany*

Boundary integrodifferential equations for the solution of electromagnetic scattering problems for metal-dielectric bodies: *Alexei M. Serebrennikov* Perm Federal Technical University and Ural Branch of Russian Academy of Sciences, Russia*

Numerical simulation of power-bus structures: *Marco Leone*: Siemens AG, Germany; Heinz-D. Brüns, Dietmar Leugner: Technische Universität Hamburg-Harburg, Germany*

Analysis of the coupling of a deterministic plane wave to a stochastic twisted pair of wires: *Bas L. Michielsen*: ONERA DEMR, Toulouse, France*

Modeling of composite walls in hospitals for ray-tracing and FDTD simulations: *Thomas M. Schäfer, Thorsten Kayser*, Mario Pauli, Michael Baldauf, Werner Wiesbeck: Universität Karlsruhe (TH), Germany*

11:00 – 12:30

Session 17: Room F1

Power System EMC I [Pow1]

Chair

Farhad Rachidi

Electric power grid vulnerability to natural and intentional geomagnetic disturbances: *John G. Kappenman*: Metatech Corporation, Duluth (MN), USA; William A. Radasky, James L. Gilbert: Metatech Corporation, Goleta (CA), USA*

Electromagnetic noise emission measurements near the FACTS device at the inez (AEP) station: *David Klinect, David Nichols, Ben Mehraban: American Electric Power, Columbus (Ohio), USA; Stephen Sebo, Longya Xu, Xin Liu: The Ohio State University, USA; Brian Cramer, Michael Silva: EPRI, Palo Alto (California), USA; Robert Olsen*: Washington State University, USA; Jerry Ramie: ARC Technical Resources, Inc., San Jose (California), USA*

SC

Analysis of the heatsink influence on conducted EMI generation in SMPS: *Andrea Dolente*, Ugo Reggiani, Leonardo Sandrolini, Francesco Ballerini: University of Bologna, Italy*

Crossed-frequency-admittance matrix approach for voltage quality study in distribution power system: *Andrzej Bachry, Rainer Krebs: Siemens AG, Germany; Cezary Dzienis*, Zbigniew Styczynski: Otto-von-Guericke-University Magdeburg, Germany*

11:00 – 12:30

Session 18: Room E7
Measurement Validation [MeaV]

Chair: Ralf Vick

A practical analysis of test site validation methods for radiated RF measurements above 1 GHz: *Angela Nothofer*, David Knight, Martin Alexander: National Physical Laboratory, UK; Andrew Rowell, Andrew Ward, Andy Marvin: University of York, UK*

Inter-laboratory tests of electromagnetic field measurements: *Michael Mann*, Bernd Gutheil, Karsten Glöser, Paul Weiß: University of Kaiserslautern, Germany; Hauke Brüggemeyer, Lower Saxony State Office for Ecology, Germany*

Reduction of the uncertainty in radiated susceptibility testing by introduction of the compound polarisation efficiency: *Magnus Höijer*: Swedish Defence Research Agency FOI, Sweden*

SC

Practical validation of a low cost truck container as EMC pre-compliance test facility: *Wilbert M. Ellema*: Queensland University of Technology, Australia*

14:00 – 17:10

Session 19: Room F1
Power System EMC II [Pow2]

Chair: Michel Ianoz

Voltages and currents distribution along an A.C. electrified railway line: Comparison between Measurements and Calculations: *Giovanni Lucca*, Livio Zucchelli, Maurizio Moro, Alberto Pagani: Sirti S.p.A., Italy*

Calculation of overvoltage of powertransformer windings under VFTO based on network functions: *Guishu Liang, Xile Zhang, Xiaohui Wang, Xiang Cui: North China Electric Power University, China*

Calculation of very fast transient overvoltages in transformer windings: *Xile Zhang, Guishu Liang, Haifeng Sun, Xiang Cui: University of North China, Heibei*

SC

Application of the wavelet transform to the analysis of conducted EMI in SMPSs: *Luisa Coppola*, Simone Buso: University of Padova, Italy*

Interactions between an input EMI filter and a power supply: *Stephane Brehaut, Jean-Charles Le Bunetel, Didier Magnon: Laboratoire de Micro-électronique de puissance Tours, France; Antoine Puzo: SAFT POWER SYSTEMS GROUP; Chambray-Lès-Tours, France; Alfonso Santolaria, David Gonzâlez*, Javier Gago, Josep Balcells: Universitat Politècnica de Catalunya, Spain*

Radio frequency characteristics of high power common-mode chokes: *Stefan-Peter Weber* Marcus Schinkel, Eckart Hoene, Stephan Guttowski, Werner John, Herbert Reichl: Fraunhofer IZM, Berlin, Germany*

Common mode current generated by multiple transient sources on grounding grids: *Marcos Mattos: Okime Eletromagnetismo Aplicado, São Paulo, Brazil*

14:00 – 15:30

Session 20: Room E7
System Level EMC [SysL]

Chair: Frank Leferink

Proposal of a modified Kron computation technic for complex EMC problems: *Olivier Maurice*: EADS-CCR, Suresne, France; Mohamed Ramdani: ESEO, Angers, France; Aubry Picard, François Fouquet: ESIGELEC, St. Etienne du Rouvray, France*

Analysis of the wire coupling under an aperture illuminated by an incident field by means of a topological approach: *Phumin Kirawanich, Nakka S. Kranthi, A.R. Stillwell, Naz E. Islam: University of Missouri, Columbia (MO), USA; Forrest J. Agee*: Air Force Office of Scientific Research, USA; Sumuru Joe Yakura: Air Force Research Lab, USA*

SC

Modeling of a large ground structure by an equivalent circuit for low frequency applications: *Thiemo Stadtler*, Jan Luiken ter Haseborg: Hamburg University of Technology, Germany*

A closed-form formulation for the total power radiated by a single-wire overhead line: *Andrea Cozza*, Flavio Canavero: Politecnico di Torino, Italy; Bernard Démoulin: Université des Sciences et Technologies de Lille, France*

14:00 – 15:30 *Session 21: Room F7*

Computational Electromagnetics II [Comp2]

Chair Hermann Singer

SC **Efficient generalized circuital analysis of rectangular semi-anechoic chambers and NSA computation:** *Ignacio Monterde*, Luis Nuno, Juan V. Balbastre: Universidad Politécnica de Valencia, Spain; Fernando D. Quesada: Universidad Politécnica de Cartagena, Spain*

Cubic and corrugated reverberation chambers: mode distribution, correlation and field uniformity: *Christian Bruns*, Pascal Leuchtmann, Ruediger Vahldieck: ETH Zurich, Switzerland*

Stability of full-wave PEEC models: reason for instabilities and way for correction: *Sergey V. Kochetov*, Guenter Wollenberg: Otto-von-Guericke-University of Magdeburg, Germany*

SC **Optimization of the matching network for microstrip-like antennas using genetic algorithm:** *Jalil Rasekhi*, Jalil Rashed-Mohassel: Univ. of Tehran, Iran*

16:00 – 17:30 *Session 22: Room E7*

Transmission Lines [Trans]

Chair Jean-Phillipe Parmantier

Transfer admittance and impedance for shielded coaxial cables: evaluation by voltage measurements and model tuning: *Giulio Antonini, Antonio Orlandi*, Romeo Michele Rizzi: University of L'Aquila, Italy*

Effect of modelling fringing and losses for a microstrip on the radiated emission characteristics: *Bert W.J. Wong: Curtin University of Technology, Perth WA, Australia; Antonio Cantoni, Kevin Fynn: Western Australian Telecommunications Research Institute; Joe Trinkle: University of Western Australia*

SC **Numerical investigation of crosstalk effect in coupled coplanar waveguides with linear frequency dependent loads:** *Tomasz Stefanski*, R&D Marine Technology Centre, Poland; Bogdan J. Janiczak: Gdañsk University of Technology, Poland*

Inclusion of proximity effect on full-wave analysis of interconnects with arbitrary conductor shapes: *Antonio Maffucci, Fabio Villone: Università di Cassino, Cassino, Italy; Giovanni Miano, Università di Napoli Federico II, Italy*

16:00 – 17:10 *Session 23: Room F7*

EMC Protection [Prot]

Chair Robert Olsen

Ageing of shielding joints; shielding performance and corrosion: *Lena Sjögren*: Swedish Corrosion Institute, Stockholm, Sweden; Mats Bäckström: Swedish Defence Research Agency, Sweden*

SC **Shielding effectiveness of woven carbon fiber composite materials for aerospace applications:** *Simon Paul Rea*, David Linton: Queens University, Belfast, UK; Eddie Orr, Jonathan McConnell: Bombardier Aerospace, Belfast, UK*

Study on reducing common-mode current on a wire through an aperture with a ring stack: *Sungtek Kahng*: University of Incheon, Korea*

SC

Students Contest

Papers taking part in the students contest have a poster presentation in addition to the regular presentation at the symposium. The posters are presented by the student authors in the exhibition hall on Wednesday 13:00–15:30. Refreshments are offered to all conference participants visiting this event. A jury will rate the presentations and the winners will be invited to the conference banquet in order to receive the prices.

Topical Meeting on Biomedical EMC

08:00 – 12:40

Wednesday, February 16, 2005

Session 1: Room F3
Medical I

Chair: Elise Fear and Susan Hagness

Thermal analysis of catheter antennas for microwave ablation therapy: *Stefano Pisa, Marta Cavagnaro, Emanuele Piuzzi, Paolo Bernardi: University of Rome, Italy; James C. Lin: University of Illinois, USA*

Characteristics of single-arm microstrip archimedean spiral antennas in near field probing of tissue: *Svein Jacobsen*: University of Tromso, Norway; Hans Olav Rolfsnes, Paul Stauffer: University of California, USA*

A quantitative comparison of calculated and measured 3-D temperature data sets using a 3-D hyperthermia applicator inside a 1.5 Tesla tunnel-type MR tomograph: *Jacek Nadobny, Waldemar Wlodarczyk, Lothar Westhoff, Johanna Gellermann, Roland Felix, Peter Wust: Charité Universitätsmedizin Berlin, Germany*

Pulsed response of optimally absorbing tissue layers for hyperthermic applications: *Daniel Razansky, Pinchas D. Einziger, Dan R. Adam: Technion – Israel Institute of Technology, Israel*

Bessel transform electrical impedance tomography method for reconstruction of layered biological tissues: *Madlena Dolgin, Pinchas D. Einziger: Technion – Israel Institute of Technology, Israel*

Sensing biomolecules with microwave and terahertz frequencies: *Daniel W. van der Weide, Min Ki Choi, Kimberly Taylor, Alan Bettermann: University of Wisconsin, USA*

Phase effects in terahertz pulsed imaging: *Sadie Reed, Elizabeth Berry, A. Giles Davies, Andrew P. Foulds, Mark R. Stringer: University of Leeds, UK*

3D microwave breast tomography: 3D data acquisition and agorithm development: *Paul M. Meaney, Qianqian Fang, Timothy Raynolds, Margaret W. Fanning, Lincoln Potwin, Colleen J. Fox, Keith D. Paulsen: Dartmouth College, NH, USA*

Non-linear microwave tumor imaging in a heterogeneous female breast: *Bert Jan Kooij: Delft University of Technology, The Netherlands*

Estimation of average breast tissue properties at microwave frequencies using a time-domain inverse scattering technique: *David W. Winters, Essex J. Bond, Susan C. Hagness, Barry D. Van Veen: University of Wisconsin – Madison, USA*

Microwave imaging for mammography using an iterative time-domain reconstruction algorithm; initial experiments: *Andreas Fhager, Parham Hashemzadeh, Mikael Persson: Chalmers University of Technology, Sweden; Lars Bååth: Halmstad University, Sweden*

14:00 – 15:20

Session 2: Room F3
Medical II

Chair: Elise Fear and Susan Hagness

Tissue sensing adaptive radar for breast tumour detection: Investigation of issues for system implementation: *Jeff M. Sill, Trevor C. Williams, Elise C. Fear: University of Calgary, Canada*

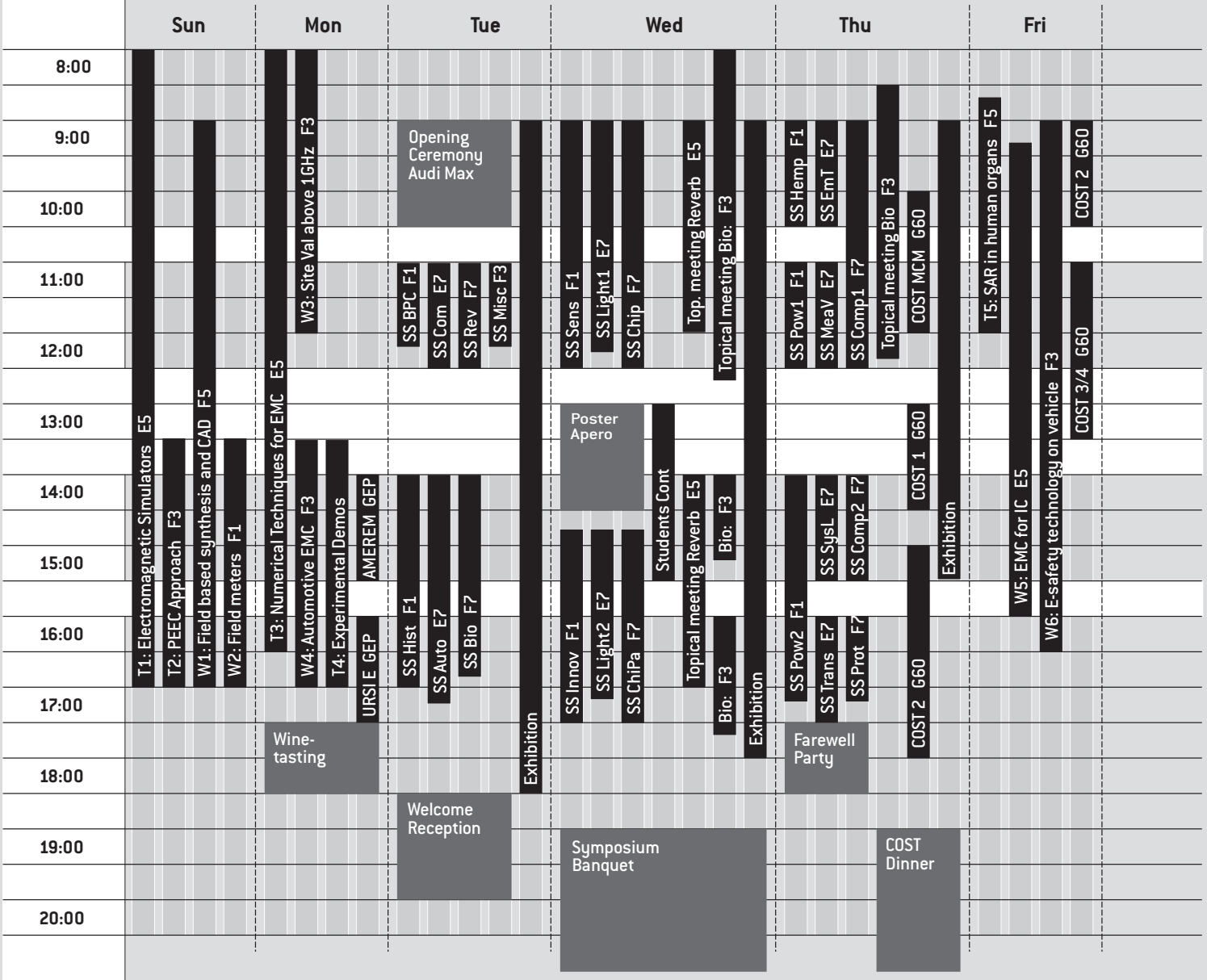
Symposium Sessions

Nr	Title	Abbr	Day	Time	Room	Chair
1.	Broadband Powerline Communications	[BPC]	Tue	11:00–12:10	F1	Mike Marcus
2.	EMC in Communications	[Com]	Tue	11:00–12:30	E7	Pascal Leuchtmann
3.	Reverberation Chambers and TEM Cells	[Rev]	Tue	11:00–12:30	F7	Heyno Garbe
4.	Miscellaneous	[Misc]	Tue	11:00–12:10	F3	Armin Kälin
5.	History of EMC	[Hist]	Tue	14:00–16:30	F1	Rüdiger Vahldieck
6.	Automotive EMC	[Auto]	Tue	14:00–17:10	E7	Robert Weigel
7.	Bioelectromagnetics	[Bio]	Tue	14:00–16:50	F7	Michal Okoniewski
8.	Sensors and Antennas	[Sens]	Wed	09:00–12:30	F1	Jan Luiken ter Haseborg
9.	Lightning and its Effects I	[Light1]	Wed	09:00–12:10	E7	Vladimir A. Rakov
10.	Chip Level EMC	[Chip]	Wed	09:00–12:30	F7	Albert Rühli
11.	EMC Innovation	[Innov]	Wed	14:45–17:30	F1	Antonio Orlandi
12.	Lightning and its Effects II	[Light2]	Wed	14:45–17:10	E7	Riccardo Zich
13.	Chip and Package Level EMC	[ChiPa]	Wed	14:45–17:30	F7	Giulio Antonini
14.	HEMP Effects (invited)	[Hemp]	Thu	09:00–10:30	F1	William Radasky
15.	Emission Testing	[EmT]	Thu	09:00–10:30	E7	Karl-Heinz Gonschorek
16.	Computational Electromagnetics I	[Comp1]	Thu	09:00–12:30	F7	Daniel de Zutter
17.	Power System EMC I	[Pow1]	Thu	11:00–12:30	F1	Farhad Rachidi
18.	Measurement Validation	[MeaV]	Thu	11:00–12:30	E7	Ralf Vick
19.	Power System EMC II	[Pow2]	Thu	14:00–17:10	F1	Michel Ianoz
20.	System Level EMC	[SysL]	Thu	14:00–15:30	E7	Frank Leferink
21.	Computational Electromagnetics II	[Comp2]	Thu	14:00–15:30	F7	Hermann Singer
22.	Transmission Lines	[Trans]	Thu	16:00–17:30	E7	Jean-Phillipe Parmantier
23.	EMC Protection	[Prot]	Thu	16:00–17:10	F7	Robert Olsen

Topical Meetings Sessions

Meeting	Session	Day	Time	Room
Biomedical	Medical I	Wed	08:00–12:40	F3
Biomedical	Medical II	Wed	14:00–15:20	F3
Biomedical	Low Frequency	Wed	16:00–17:40	F3
Biomedical	High Frequency	Thu	08:30–12:20	F3
Reverberation	I	Wed	09:00–12:00	E5
Reverberation	II	Wed	14:00–17:00	E5
COST 281	MCM	Thu	10:00–12:00	G60
COST 281	1	Thu	13:00–14:30	G60
COST 281	2	Thu	15:00–18:00	G60
COST 281	2	Fri	09:00–10:30	G60
COST 281	3	Fri	11:00–12:00	G60
COST 281	4	Fri	12:00–13:30	G60

All Events at a Glance



Tutorials

T1 Sun 8:00-17:00	Electromagnetic Simulators – Theory and Practice: from theory to implementation
T2 Sun 13:30-17:00	The Partial Equivalent Circuit (PEEC) Approach: from theory to implementation
T3 Mon 8:00-16:30	Numerical techniques
T4 Mon 13:30-17:00	Experimental Demonstration of EMC Principles
T5 Fri 8:45-12:00	SAR in human organs

Workshops

W1 Sun 9:00-17:00	Field-based Synthesis and Computer Aided Design of Electromagnetic Structures
W2 Sun 13:30-17:00	Field Strength Meters / Radiation Monitors
W3 Mon 8:00-12:00	Advances in Site Validation Techniques above 1 GHz
W4 Mon 13:30-17:00	Automotive EMC Simulation
W5 Fri 9:20-16:00	EMC for IC
W6 Fri 9:00-16:25	State-of-the-art of E-safety technology on vehicles

Social Events

Mon 17:30-18:30	Wine tasting
Tue 18:30-20:00	Welcome Reception
Wed 13:00-14:30	Poster Apero
Wed 19:00-22:00	Symposium Banquet
Thu 17:30-18:30	Farewell Party

Breast microwave imaging and focusing based on range migration techniques: *Daniel Flores-Tapia, Gabriel Thomas: University of Manitoba, Canada*

Breast tumour detection using a flat 16 element array: *Rajagopal Nilavalan, Ian Craddock, Jack Leendertz, Ralf Benjamin, Alan Preece: Department of Medical Physics, University of Bristol, UK*

Microwave imaging of malignant breast cancer tumor based on optimization technique: *Magda El-Shenawee*: University of Arkansas, USA; Eric Miller: Northeastern University, USA*

16:00 – 17:40

Session 3: Room F3
Low Frequency

Chair: Maria Stuchly and John Nyenhuis

Electric fields in the human body at power-line frequencies: *Maria Anna Stuchly*: University of Victoria, Canada*

Modeling of bone marrow cells in low-frequency electric field: *Roanna Chiu, Maria Anna Stuchly*: University of Victoria, Canada*

Influence on biological tissue by electric current: *Andrey N. Volobuev, Aleksandr I. Sirota, Asia U. Bakhito: Samara State University, Russia*

Interactions of time varying magnetic fields in MRI with medical implants: *John Nyenhuis, Arslan Amjad, Rungkiet Kamondetdacha, Sung-Min Park: Purdue University, USA*

Stimulation by pulsed magnetic fields: *Werner Irnich: University Hospital, Giessen, Germany*

Thursday, February 17, 2005

08:30 – 12:20

Session 4: Room F3
High Frequency

Chair

Om Gandhi and Gianluca Lazzi

A theoretical and experimental methodology for identifying dielectric models of biological cells: *Caterina Merla, Micaela Liberti, Alfonsina Ramundo Orlando, Francesca Apollonio, Guglielmo D'Inzeo: ICEmB, Rome, Italy*

MSRC measurements of high frequency non ionizing electromagnetic radiations (NIR) on living organisms: *David Roux*, Alain Vian, Pascale Goupil, Gérard Ledoigt, Sébastien Girard , Françoise Paladian, Pierre Bonnet: Blaise Pascal University (Clermont-Ferrand II), France*

Wideband complex dipole antenna design for reference measurements in the human body from radio-frequencies in the (5 to 6)GHz band: *Daniel R. Brooks, Stuart Nicol, Jacek Wojcik: APREL Laboratories, Canada*

Solving biomedical EMC problems using the ADI FDTD method: *Stefan Schmidt, Gianluca Lazzi*: North Carolina State University, USA*

Non-local coupling: how to overcome problem of large geometric ratio in numerical models: *Blaz Valic, Damijan Miklavcic: University of Ljubljana, Slovenia*

Averaged SAR computation: A neural network approach: *Mauro Francavilla, Andrea Schiavoni: Telecom Italia Lab, Torino, Italy*

Using a hybrid finite element / method of moments numerical technique for SAR compliance zone profiling of a real GSM base station antenna: *Frans J.C. Meyer, Marnus J. Van Wyk, Robert A. Kellerman: EM Software and Systems, Stellenbosch, South Africa*

Efficient calculation of human exposure in front of base station antennas by a combination of the FDTD and hybrid(2)-method: *A. Bitz, A. El Ouardi, J. Streckert, V. Hansen, University of Wuppertal, Germany*

An in-factory SAR prediction system by H-field measurements for mass production quality control purposes: *Koichi Ogawa, Akihiro Ozaki, Shoichi Kajiwara, Atsushi Yamamoto, Yoshio Koyanagi, Yutaka Saito: Matsushita Electric Industrial Co, Japan*

Sensitivity evaluation of SAR on size and permittivity of rat brains exposed to microwaves at mobile-phone frequency bands using the FDTD method: *Yisok Oh, Jong-Chul Hyun: Hongik University, Korea*

Topical Meeting on Reverberation Chambers

Wednesday, February 16, 2005

09:00 – 12:00

Session 1: Room E5
Reverberation I

Chair

Mike Hatfield and Mark Katrancha

Transient reverberation response analysis: A new mode of reverberation chamber operation: *Robert E. Richardson, Mike O. Hatfield, Michael B. Slocum, Mark F. Katrancha, Blaise L. Corbett: Naval Surface Warfare Center, Dahlgren, USA*

Modal representation of a reverberation chamber for a parametric analysis of the field uniformity: *Gérard Orjubin, Elodie Richalot, Stéphanie Mengué, Odile Picon: Université de Marne la Vallée, France*

Statistical characterization of reverberant chamber transient response using common CW-analysis tools and methods: *Blaise L. Corbett, Robert E. Richardson: Naval Warfare Center, Dahlgren, USA; Theodore H. Lehman: Albuquerque, USA*

On the electromagnetic field in loaded reverberating chambers: *Paolo Corona, Giuseppe Ferrrara, Maurizio Migliaccio: Università degli Studi di Napoli Parthenope, Italy*

Design of low cost antennas for reverberation chambers: *Michael Hillgärtner, Robert Stonies, Dirk Peier, Edgar Voges: University of Dortmund, Germany Design of low cost antennas for reverberation chambers*

14:00 – 17:00

Session 2: Room E5

Reverberation II

Chair

Mike Hatfield and Mark Katrancha

How to ... in a reverb chamber: *Garth D'Abreu: ETS Lindgren, USA*

Challenges in using a reverberation chamber for probe calibration: *John M. Ladbury, Galen H. Koepke, Randy Direen: NIST, Boulder, USA; Dennis Lewis: Boeing, Seattle, USA*

Metrology applications of reverberation chambers for electromagnetic field probe calibrations and antenna efficiency measurements: *Dennis Lewis, Boeing Puget Sound Metrology, Seattle, USA; John Ladbury, National Institute of Standards and Technology, Boulder, USA*

PICAROS program: reproducibily validation of radiated immunity and emission measurements in mode stirred reverbaration chamber (MSRC): *Sébastien Girard, Françoise Paladian, Raphaël Vernet, Pierre Bonnet: Blaise Pascal University (Clermont-Ferrand II), France; Fabien Mangeant, Albin Maridet: EADS CCR, Suresnes, France; Vincent Bérat, Régis Seguin: RENAULT Technocentre, France; Rémy Perrot: UTAC/ DT / Service CEM, Montlhery, France*

Electromagnetic radiation measurements in two specific models of three-dimensional TEM cells: *Virginie Deniau, Jean Rioult, Jean-Pierre Ghys: INRETS, France; Marco Klingler: PSA, France; Bernard Démoulin: University of Lille, France; Serge Ficheux: UTAC, France*

COST 281

Thursday, February 17, 2005

08:15 – 10:00 **Steering Committee Meeting (SCM) in room F 33.4**

10:00 – 12:00 **Management Committee Meeting (MCM) in room G 60**

12:00 – 13:00 **Lunch in GEP-Pavillon**

Workshop

"Make sinusoidal versus non-sinusoidal wave forms a difference?"

Session 1: Room G60

Modulation of RF-fields in mobile phones and other technologies.

13:00 – 13:45 **Mobile communication signals on the air:** *Werner Bächtold, Swiss Federal Institute of Technology (ETH), Zurich, Switzerland*

13:45 – 14:30 **Signal forms in wireless applications:** *Jørgen Bach Andersen, Aalborg University, Denmark*

Session 2: Room G60

Biological effects of modulated versus nonmodulated fields including extremely high power microwave pulses.

15:00 – 15:45 **Comparison of continuous wave and pulsed exposure: mechanisms and biological effects:** *Kenneth R. Foster, University of Pennsylvania, Philadelphia, USA*

15:45 – 16:30 **An Overview of Genotoxic Potential of Electromagnetic Radiation with different modulations in Mammalian Somatic Cells:** *Vijayalaxmi, University of Texas, San Antonio, USA*

16:30 – 17:00	Coffee Break
17:00 – 17:30	Influence of pulse-modulated GHz microwaves on the excitation of human nerves and muscles compared with continuous wave exposure: *Jiri Silny, Aachen University Hospital, Germany*
17:30 – 18:00	Assessment of immunotropic effects of exposure to pulse-modulated microwave radiation in relation to continuous wave exposure: *Stanislaw Szmigielski, Military Institute of Hygiene and Epidemiology, Warsaw, Poland*
19:00 – 23:00	COST-Social Event

Friday, February 18, 2005

Session 2 (continued): Room G60

Biological effects of modulated versus nonmodulated fields including extremely high power microwave pulses.

09:00 – 09:30	Pulse modulation appears crucial for RF-EMF-induced alterations in brain physiology: *Peter Achermann, University of Zurich, Switzerland*
09:30 – 10:00	Climbing the Megawatt-Per-Gram SAR Peak: The Research Into Bioeffects of Extremely High Power Microwave Pulses: *Andrei G. Pakhomov, University of Texas, San Antonio, USA*
10:00 – 10:30	Discussion
10:30 – 11:00	Coffee Break

Session 3: Room G60

Nanosecond ultra wideband pulses in biotechnology

11:00 – 11:30	Electro-permeabilization of cells by pulses of high field strength and ultra-short duration: *Ulrich Zimmermann, University of Würzburg, Germany*
11:30 – 12:00	Discussion

Session 4: Room G60

Interaction mechanisms and safety standards

12:00 – 12:30	Microdosimetry, chemical noise and implications for RF effects: *James C. Weaver, Massachusetts Institute of Technology, Cambridge, USA*
12:30 – 13:00	N.N.
13:00 – 13:30	Discussion
13:30 – 14:30	Lunch in GEP Pavillon
14:30 – 16:30	Management Committee Meeting (MCM) in room G 60

Sunday, February 13, 2005

08:00 – 17:00 — ## T1 — Tutorials — Room E5

Electromagnetic Simulators – Theory and Practice

ORGANIZERS: D.G. Swanson Jr, M/A-COM, USA
W.J.R. Hoefer, Univ. of Victoria, Canada

SCHEDULE:

8:00	Welcome and Introduction: *D.G. Swanson Jr.*
8:15	Historical Background and General field Modeling Strategies: *W.J.R. Hoefer*
9:00	Questions and discussion
9:15	The Method of Moments: *W.J.R. Hoefer*
9:45	Break
10:15	Simulators using Surface Meshing I: *D.G. Swanson Jr.*
11:00	Questions and Discussion
11:15	Simulators using Surface Meshing II: *D.G. Swanson Jr.*
12:00	Lunch
13:00	Finite Element, Finite Difference and Finite Integration Methods: *W.J.R. Hoefer*
13:45	Questions and Discussion
14:00	Finite Difference-Time Domain and TLM Method: *W.J.R. Hoefer*
14:45	Break
15:15	Simulators using Volume Meshing I: *D.G. Swanson Jr.*
16:00	Questions and Discussion
16:15	Simulators using Volume Meshing II: *D.G. Swanson Jr.*
17:00	Closure

13:30 – 17:00 — ## T2 — Tutorials — Room F3

The Partial Equivalent Circuit (PEEC) Approach: from theory to implementation

ORGANIZERS: G. Antonini, University of L'Aquila, Italy
A. Ruehli, IBM, T. J. Watson Research Center, USA
J. Ekman, University of Lulea, Sweden

SCHEDULE:

13:30	Overview of the Partial Element Equivalent Circuit (PEEC) Method: *A. Ruehli*
14:45	Recent Advancements in PEEC Modeling: *G. Antonini*
15:45	Break and Discussions
16:15	Implementation and Application of the PEEC Method: *J. Ekman*

Monday, February 14, 2005

08:00 – 16:30 — ## T3 — Tutorials — Room E5

Numerical Techniques

ORGANIZER: Tapan K. Sarkar, Syracuse University, USA

SCHEDULE:

8:00	Overview of Numerical methods applicable to EMC problems: *Tapan K. Sarkar*
8:15	Advantage of modeling using HOBF (higher order basis functions) for solving integral equation based methods: *Branko M. Kolundzija: University of Belgrade, Serbia*
9:15	Application of FDTD and FVDT for solving EMC problems: *François Paladian, Pierre Bonnet, France*
10:15	Break/discussions

10:45 Finite elements in frequency and time domain: *Magdalena Salazar: Universidad Politécnica de Madrid, Spain*

11:45 Lunch

13:00 Semi-analytic field solvers for EMC problems: *Ch. Hafner: ETH Zurich, Switzerland*

14:00 Model based parameter estimation: how to exploit the principle of analytic continuation: *Tapan K. Sarkar: Syracuse University, USA*

15:00 Break

15:30 Discussion and „Questions and Answers"

16:30 Closure

13:30 – 17:00 *T4 – Tutorials* *Room F5*

Experimental Demonstration of EMC Principles

ORGANIZER: T. Van Doren, EMC Lab. Univ. Of Missouri-Rolla, USA

SCHEDULE:

13:30 The path of least impedance and resonance

14:30 Break

14:45 Self shielding, grounding, and energy coupling mechanisms

15:45 Break

16:00 Externally added electric-field, magnetic-field and electromagnetic wave shielding

17:00 End

Friday, February 18, 2005

08:30 – 12:00 *T5 – Tutorials* *Room F5*

SAR in human organs

ORGANIZER: L. Inzoli, Italy

SCHEDULE:

8:45 Introduction to SAR and application example: *Luciano Inzoli*

9.30 SAR and resulting temperature distribution for microwave exposure up to 30GHz - numerical simulations and measurements: *Achim Bahr: IMST GmbH, Germany; Frank Gustrau: FH Dortmund – University of Applied Sciences, Germany*

10.30 The simulation of HF wave-to-biotissue interactions with Finite Volume unstructured meshing techniques: *Amaury Soubeyran et al., EADS/CCR, France*

11.15 Interference of pacemakers by multimedia communication terminals: *Achim Bahr: IMST GmbH, Germany; Frank Gustrau: FH Dortmund – University of Applied Sciences, Germany*

Sunday, February 13, 2005

09:00 – 17:00

WS1 –Workshops Room F5

Field-based Synthesis and Computer Aided Design of Electromagnetic Structures

ORGANIZERS: N.K. Nikolova, McMaster University, Canada
M.H. Bakr, McMaster University, Canada

SCHEDULE:

9:00	Opening remarks
9:05	The origin of nonuniqueness in inverse electromagnetic problems: a review: *Natalia K. Nikolova: McMaster University, Canada*
9:30	Solving challenging electromagnetic problems from DC to daylight (almost) on your personal computer: *Magdalena Salazar-Palma: Universidad Politéchnica de Madrid, Spain; Tapan Sarkar: Syracuse University, USA*
10:00	Application of reduced order models in the optimization of electromagnetic devices: *Klaus Krohne, Rüdiger Vahldieck: ETH-Zurich, Switzerland*
10:30	Coffee break
10:50	Neural networks for fast optimization of EM structures: *Qi-Jun Zhang, Carleton University, Canada*
11:20	Modeling of electromagnetic sources by means of a genetic algorithm: *Margherita Buzzo Margari, Flavio Canavero: Politecnico di Torino, Italy; Manuela Baroni, Filippo Marliani: ESA - ESTEC*
11:50	Extracting sensitivities from full-wave electromagnetic solutions: *Mohamed H. Bakr: McMaster University, Canada*
12:20	Lunch break
13:30	Computer-aided synthesis and design of microwave filters: *Smain Amari, Royal Military College of Canada; Uwe Rosenberg: Marconi Communications GmbH, Germany*
14:00	Optimization strategies for EM-based design of microwave filters and multiplexers: *Piotr Kozakowski, Adam Lamecki, Michal Mrozowski: Gdansk University of Technology Nartutowicza, Poland*
14:30	TLM based hybrid time domain modeling applied to the design of EM structures: *Peter Russer, Petr Lorenz: Munich University of Technology, Germany*
15:00	Coffee break
15:15	Field-based computer-aided design with MEFisto-3D: *Wolfgang J.R. Hoefer, Poman P.M. So: University of Victoria, Canada*
16:00	Advanced electromagnetic design and optimisation techniques using the field solver package FEKO: *Markus Schick, Niels Berger, Ulrich Jakobus: EM Software & Systems GmbH, Germany; C.J. Reddy: EM Software & Systems (USA) Inc.*

13:30 – 17:00

WS2 –Workshops Room F1

Field Strength Meters / Radiation Monitors

ORGANIZER: T. Schrader, PTB, Germany

SCHEDULE:

13:30	Technical specifications of radiation monitors: *Zhong Chen: ETS Lindgren*
14:10	Survey of international probe calibration standards and practices: *Tim Harrington, US Federal Communications Commission*
14:50	Aspects of field strength meters and „radiation monitors“ used for public and occupational safety: *Hannah Heinrich: 2h-engineering, Hausen*

15:20 Coffee break

15:40 Field strength meters / radiation monitors - Experiences of a calibration laboratory: *Frederic C. Pythoud: metas, Switzerland*

16:20 Applying data from a calibration certificate to a user's measurement uncertainty budget: *Reiner Pape, Klaus Münter, Thorsten Schrader: PTB, Germany*

Monday, February 14, 2005

08:30 – 12:00 *WS3 –Workshops Room F3*

Advances in Site Validation Techniques above 1 GHz

ORGANIZER: M.D. Foegelle, ETS-Lindgren, USA

SCHEDULE:

08:00 Advances in site validation techniques above 1 GHz: *Donald Heirman, Don HEIRMAN Consultants, USA*

08:25 Site validation above 1 GHz (CISPR SC/A proposals): *Clark Vitek, Senior EMC Engineer, extreme networks, USA*

08:50 Antenna characteristics above 1 GHz: *Michael D. Foegelle, ETS-Lindgren, USA*

09:15 Chamber validation using a field probe: *Alexander Kriz, ARC Seibersdorf Research GmbH, Austria*

09:40 Coffee Break

10:10 CISPR > 1GHz round robin: *Ken Hall, HP, USA*

10:35 Calibrating antennas above 1 GHz: A practical approach: *David Gentle, National Physical Laboratory, UK*

11:00 Analysis of 1-18 GHz biconical antennas - from a CISPR perspective: *Dieter Schwarzbeck, Schwarzbeck Mess-Elektronik, Germany*

11:25 Sources of uncertainty for emission measurements above 1 GHz: *Pierre Beeckman, Philips, Netherlands*

12:00 Closure

13:30 – 17:00 *WS4 –Workshops Room F3*

Automotive EMC Simulation

ORGANIZERS: Gernot Steinmair, BMW, München, Germany
Robert Weigel, University of Erlangen-Nuremberg, Germany

SCHEDULE:

13:30 Automotive EMC simulation process and methods: *Gernot Steinmair, BMW Group, Germany*

13:55 Emission models for VLSI ICs: *Thomas Steinecke, Infineon Techn., Munich, Germany*

14:20 EMC-Simulation on PCB-level: ideas, options and realisation: *Wolfram Meyer, Siemens, Germany*

14:45 Linkage of PCB and cable harness simulation for combined EMC analysis: *Matthias Tröscher, SimLab Software GmbH, Munich, Germany*

15:10 Coffee Break

15:45 EMC simulation using nonorthogonal PEEC modeling: *Martin Ludwig Zitzmann, BMW Group, Germany*

16:10 Shielded cables with numerical simulation: *Matthias Giese, Hanns Ruder, Universität Tübingen, Germany; Ralf Ehrhard, Andreas Ludwig, DaimlerChrysler, Germany*

16:35 Recent advances in electromagnetic field modelling technologies as applied to automotive EMC applications: *Ulrich Jakobus, EM Software & Systems GmbH, Germany*

Friday, February 18, 2005

09:20 – 16:00 **WS5 –Workshops** **Room E5**

EMC for IC

ORGANIZER: C. Lochot, Freescale Semiconductor, France

SCHEDULE:

9:20 **ICEM Model:** *Jean-Luc Levant*, ATMEL Nantes, Mohamed Ramdani, Richard Perdriau, Ecole Supérieure d'Electronique de l'Ouest Angers, M'hamed Drissi: INSA Rennes, France*

9:40 **LECCS (linear equivalent circuit and current source) modeling technique for ICs:** *Yuichi Mabuchi*, Hitachi Ltd, Japan; Atsushi Nakamura, Renesas Technology Corporation; K. Ichikawa, DENSO Corporation, T. Unou, Osami Wada: Okayama University, Japan*

10:00 **3-wire model to predict RF emission:** *Mart Coenen*, Philips, Ege Engin, Heiko Koehne, G. Sommer, Werner John: Fraunhofer Institute for Reliability and Microintegration, Germany*

10:20 **Coffee Break**

10:50 **PLL jitter improvment using ICEM architecture:** *Jean-Luc Levant*, ATMEL Nantes, Mohamed Ramdani, Richard Perdriau, Ecole Supérieure d'Electronique de l'Ouest Angers, M'hamed Drissi: INSA Rennes, France*

11:10 **Bottom up approach for modeling and simulation of conducted emission of VLSI ICs:** *Thomas Steinecke*, Infineon Techn. Munich, Germany; Heiko Köhne, M. Schmidt, Werner John, Eh. H. Reichl: Fraunhofer, Berlin, Germany*

11:30 **Exploitation of the ICEM model in an automotive application:** *Frédéric Lafon*, Christophe Lochot, François De-Daran, Olivier Maurice, Sebastien Calvet:*

11:50 **Lunch Break**

13:00 **Predicting conducted emission in integrated circuits: an ICEM-based design reuse methodology:** *Richard Perdriau*, Mohamed Ramdani, Jean-Luc Levant: France*

13:20 **Re-use of ICEM for immunity simulation:** *Stephane Baffreau*, Frederic Lafon, Etienne Sicard, Francois De-Daran: lesia and valeo, France*

13:40 **Complete system topological approach using the Kron's method:** *Olivier Maurice*, Gilles Akoun, J. Aspas-Puertolas: EADS CRC Suresnes, France*

14:00 **CESAME test chip modeling with ICEM:** *Sonia Bendhia*, Bertrand Vrignon, Lionel Courau, Etienne Sicard: Toulouse, France*

Coffee Break

14:20

14:40 **EMC Standardization for ICs:** *Mart Coenen*: Philips, Netherlands*

15:00 **EMC measurement relation between IC and system in automotive application:** *Christian Marot*: Siemens, Germany*

15:20 **Impluse immunity test method:** *Mart Coenen*, Sandeep Bakshi: Philips, Netherlands*

15:40 **Conducted impulse injection method (CIIM):** *Guenther Auderer*: TIC, Germany*

09:00 – 16:25

WS6 –Workshops Room F3

State-of-the-art of E-safety technology on vehicles

ORGANIZER:

G. D'Anzieri, SYDERA s.r.l.(Aerospace Systems), Italy
M. Audone, CRF S.c.p.a. (Research Centre for automotive application), Italy

SCHEDULE:

9.00	**The SAFETEL program - purposes and objectives:** *Giovanni D'Anzieri, SYDERA, Italy*
9:15	**EMC simulation and testing of components and subsystems:** *Lothar Geisbusch, Julia Kantz: University of Stuttgart, Germany*
10.00	**Statistical approach for the quantitative evaluation of the immunity levels of devices and systems and high intensity susceptibility signal (HISS) test method:** *Michela Audone, Torino, Italy*
10.30	**EMC simulation in the automobile industry:** *Ralf Ehrhard, Jan Waldmann, DaimlerChrysler, Germany*
11.00	**A novel technique to perform susceptibility testing:** *Bruno Audone, Sydera Torino, Italy*
11.30	**Electromagnetic simulation of automotive aystems, aubsystems, and EMC test methods:** *Ulrich Jakobus, EM Software & Systems GmbH, Germany*
12.00	**Lunch**
14:00 – 16:15	**Round table:** *Discussion and contact among attendees of the workshop*
16:15 – 16:25	**Conclusion:** *G. D'Anzieri , M. Audone*

Open Meetings

16:00 – 17:30

URSI Comm E
Monday 16-17:30 Room GEP

14:00 – 15:30

AMEREM/EUROEM
Monday 14-15:30 Room GEP

Technical Exhibition

From Tuesday to Thursday there is an exhibition on EMC and RF/Microwave Measurements & Instrumentation in the large gymnastic hall. To go there please follow the signs „Exhibition" starting from the main hall.

Social Program — E & D (Eating and Drinking)

Coffee breaks:
Coffee and refreshments will be available free of charge during the breaks in the exhibition hall. Refreshments can also be purchased in the cafeterias located in the main building, E and F floors, and underneath the Polyterasse.

Lunch:
Lunch is provided for all symposium attendees in the Polyterasse Mensa. Be sure to bring your lunch tickets and to wear your badge. Please note that lunch can also be purchased on a walk-in basis in the Mensa.

Wine tasting party:
Monday, 17:30-18:30
All the attendees of the workshops and tutorials are invited to a wine and cheese tasting event in the second floor (F) of the main symposium building. Tickets for symposium attendees who did not register for a workshop or a tutorial can also be purchased at the registration desk.

Welcome reception:
Tuesday, 18:30-20:00
An Exhibitors break beginning at 17:00 will provide lecture-free time for the visit of the exhibits. All Symposium attendees are then cordially invited to the cocktail reception, opening at 18:30 in the exhibition Hall. Badge required for admission.

Poster apero:
Wednesday, 13:00-14:30
Wine and refreshments will be served during the poster session in the exhibition hall.

Symposium banquet:
Wednesday, 19:30-22:00
The EMC symposium banquet will be held at the Kongresshaus Zurich (Claridenstrasse 5). The evening will consist of an elegant dinner with entertainment. The Kongresshaus is within walking distance from the tram station „Bürkliplatz" (Tram 2,5,8,9, or 11).

Farewell party:
Thursday, 17:30-18:30
The farewell party will take place after the last sessions on Thursday in the main hall, first floor.

Welcome tea:
Tuesday, 14:30-15:30
A welcome tea will be offered to spouses and guests accompanying conference participants. Information about sightseeing tours will be given there. Meeting point: Fountain in the main hall of the conference building, 14.30.

Social Program — Tours

ORGANIZER: **Mrs I.-M. Fumeaux, Zürich**

Technical excursions:

E1: *Friday February 18:*

Dätwyler Fiber Optics SA (Boudry):
Dätwyler is a leading supplier of high-quality systems solutions and services in the structured cabling, telecom carriers, safety and building automation, and elevator cabling industries. (http://www.daetwyler.net/e/index.htm). Visit of the material and single mode fiber production factory in Boudry in Western Switzerland. Lunch is provided.

E2: *Friday morning, February 18:*

Swissbit (Bronschhofen):
Swissbit Group is Europe's leading producer of memory products with 4 million manufactured units per year. The group produces memory modules for desktops, servers, workstations and notebooks as well as USB Flash Memories and CompactFlash Cards. (http://www.swissbit.ch) Half-day visit of a memory module production factory in Bronschhofen in Eastern Switzerland.

Bus departure from Symposium building, underground passage at 8.00 (to be confirmed). Since the number of places is limited, confirm your advance registration at the Information Desk until Wednesday, February 16, 13.00!

General Information

Currency

All fees are covered in Euro (€). In Switzerland however the official currency is the Swiss Franc (CHF).

Badge

Conference badge will be delivered on site at the conference registration desk. Only participants wearing the badge will be admitted to the sessions and other events (free access to the technical exhibition)

Internet Café

5 PCs with internet access will be available in the exhibition hall. In addition to that there is a public wireless LAN access for using your own Laptop (in the exhibtion hall only).

Language

The official conference language is English.

Weather

The temperature during the day in Zurich in February is in general around 5°C (41°F), with a possibility of temperatures below the freezing point. Rain or snow is possible.

Medical Aid

Please contact the information desk. A hospital is just across the street.

Public Transport

Conference participants are provided with a ticket valid for all bus, tram, boat, Polybahn or train within the city of Zurich for the whole week. Tram 6, 9 and 10 have stops in front of the conference building (Tramstop ETH/Universitätsspital). The nostalgic Polybahn connects ETH with the Central, close to Zurich railway main station ("Hauptbahnhof").

Taxi

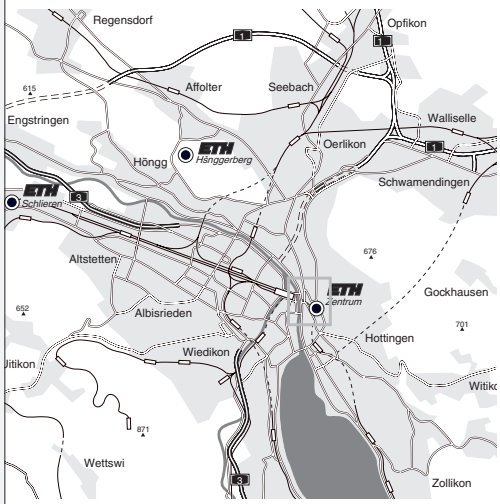
In front of the conference building, Rämistrasse 101. Please, contact the information desk.

Airport

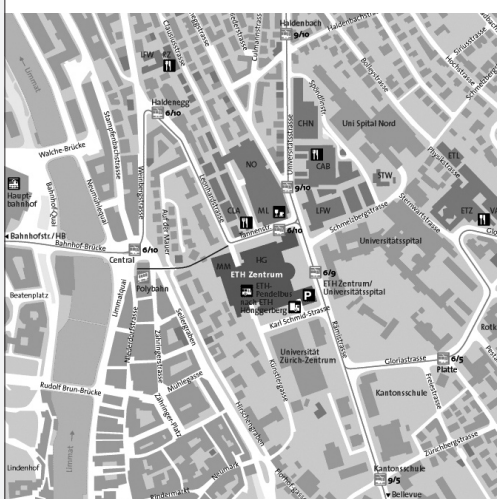
Unique airport Zurich is about 15 km away from Downtown Zurich. Different hotel buses are available. From Zurich Airport you can find a train connection nearly every 15 minutes to Zurich Main Station as well as roughly every hour to other Swiss cities.

Plan of the City

Area of Zurich

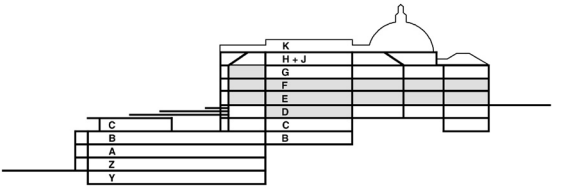


ETH area down to HB

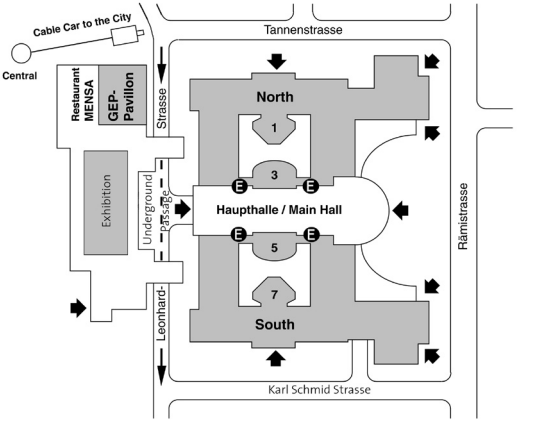


Plan of the building

HG and Polyterrasse



MM Polyterrasse/Polyterrace **HG** Hauptgebäude/Main Building



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Cooperating Organizations

Association of Electrical and Electronics Engineers (SEV), Electrosuisse

Association of Polish Electrical Engineers (SEP)

Austrian Electrotechnical Association (ÖVE)

Chinese Institute of Electronics (CIE)

European Broadcasting Union (EBU)

Finnish Electrotechnical Standards Association (SESKO)

International Telecommunication Union (ITU)

IEEE Electromagnetic Compatibility Society (IEEE EMC-S)

IEEE Switzerland Section

IEEE Swiss Chapter on AP/MTT/EMC

Institute of Electronics, Information and Communication Engineers, Japan (IEICE)

The Institution of Electrical Engineers (IEE)

International Union of Radio Science (URSI)

Italian Electrotechnical and Electronic Association (AEI)

Swiss Federal Institute of Technology Zurich (ETHZ)

International Telecommunication Union (ITU)

VDE Association for Electrical, Electronic & Information Technologies

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IEEE Electromagnetic Compatibility Society (IEEE EMC-S)

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The Institution of Electrical Engineers (IEE)

Swiss Electrotechnical Association (electrosuisse)

Official Conference Carrier: Swiss International Air Lines (Swiss)