

EMC'14/Tokyo

2014 International Symposium on
Electromagnetic Compatibility, Tokyo

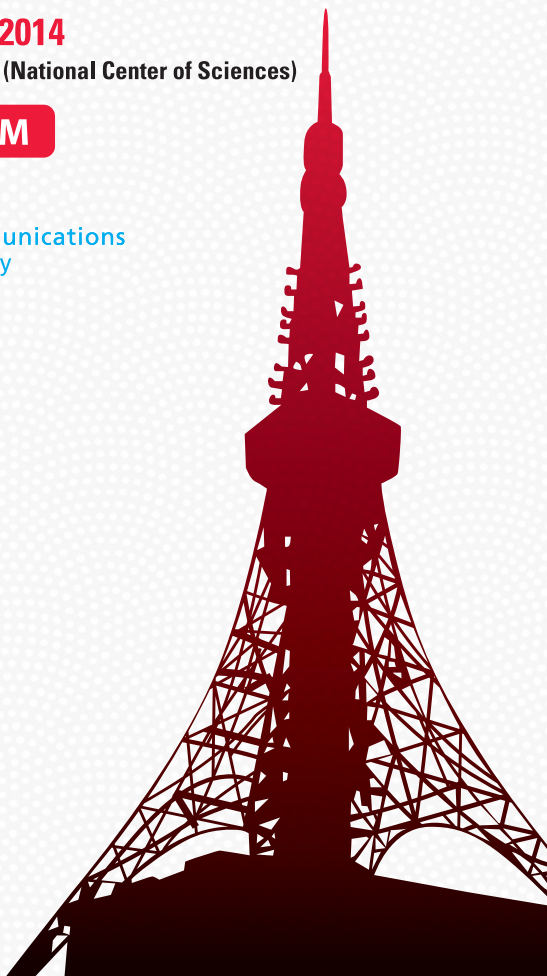
May 12-16, 2014

Hitotsubashi Hall (National Center of Sciences)

PROGRAM



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Timetable

		Room H	Room A
13 May (TUE)	AM1 10:00-11:20	10:00-11:20 [13A1-H] Numerical Modeling (1)	10:00-11:20 [13A1-A] Power Electronics & Vehicles (1)
	Coffee Break		
	AM2 11:40-13:00	11:40-13:00 [13A2-H] Numerical Modeling (2)	11:40-13:00 [13A2-A] Power Electronics & Vehicles (2)
	Lunch Break		
	PM1 14:30-15:50	14:30-15:50 [13P1-H] Numerical Modeling (3)	14:30-15:50 [13P1-A] EMC Management and Standards
	Coffee Break		
	PM2 16:10-17:40	16:10-17:40 [Plenary Session: 13P2-H] New Horizon of EMC Research (at Room H)	
		Welcome Reception	(at Room A & B)

		Room H	Room A
14 May (WED)	AM1 09:30-10:50	09:30-10:50 [14A1-H] Numerical Modeling/ Biological Effects	09:30-10:50 [Organized Session: 14A-A] Improving the Measurement Uncertainty of EMI Testing
	Coffee Break		
	AM2 11:10-12:40	11:10-12:40 [Keynote Session: 14A2-H] Overview of EMC Research Trends	11:10-12:30 [Organized Session: 14A-A] (Continued)
	Lunch Break		
	PM1 14:00-16:00	14:00-16:00 [14P1-H] Biological Effects, EMF Safety & EMC in Medical Applications and Safety (2)	14:00-16:00 [Organized Session: 14P1-A] Metrological Approach for Result Validation and Improvement of Measurement Quality
	Coffee Break		
	PM2 16:20-18:40	16:20-18:40 [Organized Session: 14P2-H] Active Implantable Medical Device EMI	16:20-18:20 [Organized Session: 14P2-A] EM Information Leakage

		Room B	Room S
13 May (TUE)	AM1 10:00- 11:20	10:00-11:20 [Organized Session: 13A-B] Signal Integrity and Unintentional EM Radiation Related to Printed Circuit Boards	10:00-11:20 [Organized Session: 13A-S] Electromagnetic Phenomena Associated with Earthquakes : Earthquake Prediction
	Coffee Break		
	AM2 11:40- 13:00	11:40-13:00 [Organized Session: 13A-B] (Continued)	11:40-13:00 [Organized Session: 13A-S] (Continued)
	Lunch Break		
	PM1 14:30- 15:50	14:30-15:50 [13P1-B] Chip, Package, PCB & Cables (1)	14:30-15:50 [13P1-S] Biological Effects, EMF Safety & EMC in Medical Applications and Safety (1)
	Coffee Break		
	PM2 16:10- 17:40	16:10-17:40 [Plenary Session: 13P2-H] New Horizon of EMC Research (at Room H)	
	Welcome Reception (at Room A & B)		

		Room B	Room S
14 May (WED)	AM1 09:30- 10:50	09:30-10:50 [14A1-B] Chip, Package, PCB & Cables (2)	09:30-10:50 [Workshop: 14A-S] Recent Lightning Current Data from Instrumented Towers
	Coffee Break		
	AM2 11:10- 12:40	11:10-12:30 [14A2-B] Chip, Package, PCB & Cables (3)	11:10-12:30 [Workshop: 14A-S] (Continued)
	Lunch Break		
	PM1 14:00- 16:00	14:00-16:00 [Organized Session/ Workshop: 14P1-B] IC Chip Level EMC for Telecommunication	14:00-16:00 [14P1-S] High Power & High Voltage EMC
	Coffee Break		
	PM2 16:20- 18:40	16:20-18:20 [Organized Session: 14P2-B] 3D-IC and Packages	16:20-17:40 [14P2-S] Power System EMC

		Room H	Room A
15 May (THU)	AM1 09:30- 10:50	09:30-10:50 [Organized Session: 15A-H] EMC Aspects of Wireless Power Transfer Systems	09:30-10:50 [15A1-A] EMC Measurements (1)
	Coffee Break		
	AM2 11:10- 12:30	11:10-12:30 [Organized Session: 15A-H] (Continued)	11:10-12:30 [15A2-A] EMC Measurements (2)
	Lunch Break		
	PM1 14:00- 15:20	14:00-15:20 [Organized Session/ Workshop: 15P-H] Automotive EMC	14:00-15:20 [15P1-A] EMC Measurements (3)
	Coffee Break		
	PM2 15:40- 17:20	15:40-17:00 [Organized Session/ Workshop: 15P-H] (Continued)	15:40-17:20 [15P2-A] Biological Effects, EMF Safety & EMC in Medical Applications and Safety (3)
Banquet & Award Ceremony (at Josui Kaikan)			

		Room H	Room A
16 May (FRI)	AM1 09:30- 10:30	9:30-10:30 [16A1-H] Biological Effects, EMF Safety & EMC in Medical Applications and Safety (4)	9:30-10:50 [16A1-A] EMC Measurements (4)
	Coffee Break		
	AM2 10:50- 12:30	10:50-12:30 [Organized Session: 16A2/P1-H] Recent Trends of Standardization Activities and Evaluation Techniques for the Electromagnetic Exposure to the Human Body	Coffee Break 11:10-12:30 [16A2-A] Communication System EMC (1)
	Lunch Break		
	PM1 14:00- 14:40	14:00-14:40 [Organized Session: 16A2/P1-H] (Continued)	14:00-15:20 [16P1-A] Communication System EMC (2)
	PM2 14:40- 16:20	14:40-16:20 [Workshop: 16P2-H] Photonics-applied Electromagnetic Measurement	Coffee Break 15:40 - 18:20 [Tutorial: 16P2-A] Recent Topics of EMC Standardization - Role of ACEC
	PM3 16:40- 18:20	16:40-18:20 [Organized Session: 16P3-H] Photonics-applied Electromagnetic Measurement for EMC	

		Room B	Room S
15 May (THU)	AM1 09:30-10:50	09:30-10:50 [15A1-B] Chip, Package, PCB & Cables (4)	09:30-10:50 [Workshop: 15A-S] Recent Trend of EMC on Smart Grid
	Coffee Break		
	AM2 11:10-12:30	11:10-12:30 [15A2-B] Chip, Package, PCB & Cables (5)	11:10-12:30 [Workshop: 15A-S] (Continued)
	Lunch Break		
	PM1 14:00-15:20	14:00-15:20 [Organized Session/ Workshop: 15P-B] EMC Topics Related to Smart Grid	14:00-15:20 [Organized Session: 15P1-S] Electromagnetic Noise Radiation and EMI Effects Caused by ESD
	Coffee Break		
	PM2 15:40-17:20	15:40-17:00 [Organized Session/ Workshop: 15P-B] (Continued)	
Banquet & Award Ceremony (at Josui Kaikan)			

		Room B	Room S
16 May (FRI)	AM1 09:30-10:50	9:30-10:50 [16A1-B] Immunity / Susceptibility, ESD and Transients (1)	9:30-10:50 [Organized Session: 16A1-S] Computational Techniques, Modeling, and Simulation for Electromagnetics
	Coffee Break		
	AM2 11:10-12:30	11:10-12:30 [16A2-B] Immunity / Susceptibility, ESD and Transients (2)	11:10-11:50 [Organized Session: 16A1-S] (Continued)
			11:50-12:30 [16A2-S] Numerical Modeling (4)
	Lunch Break		
	PM1 14:00-16:00	14:00-16:00 [16P1-B] Shielding, Grounding & Materials (1)	14:00-16:00 [Organized Session: 16P1-S] GPU Computing-based Acceleration of Electromagnetic Simulation
	Coffee Break		
PM2 16:20-18:20	16:20-18:20 [16P2-B] Shielding, Grounding & Materials (2)	16:20-18:20 [Organized Session: 16P2-S] Aerospace EMC	

General Information

1. Name

2014 International Symposium on Electromagnetic
Compatibility, Tokyo (EMC'14/Tokyo)

2. Symposium Period

May 12-16, 2014

3. Venue

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(National Institute of Information and Communications Technology)

K. Murano (Tokai University)

A. Nishikata (Tokyo Institute of Technology)

N. Oka (Mitsubishi Electric Corp.)

M. Shoyama (Kyushu University)

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Y. Yamanaka

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G. Pettit (IEEE EMC Society, Past President (USA))

R. Scully (IEEE EMC Society, President (USA))

L.R. Koga (IEEE EMC Society, BoD Member (Japan))

J. He (Tsinghua University (China))

E.-P. Li (A*STAR Institute of High Performance Computing
(Singapore))

T.L. Wu (National Taiwan University (Taiwan))

Organized Sessions

Chairperson:

M. Yamaguchi (Tohoku University)

Award Program

Chairperson:

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Auditors

M. Umehira (Ibaraki University)

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Symposium Events

Technical Tour (Optional)

[Monday, May 12, 2014, 11:00-19:00]

The EMC'14/Tokyo Steering Committee has planned a technical tour for the attendees of the symposium, where they can take lectures about some EMC-related functions of TOKYO SKYTREE, and enjoy a great view of Tokyo Metropolitan Area from the observatory at the height of 350 meters.

*Only the pre-registered attendees who bought a "Technical Tour" ticket (5,000 Japanese yen) can participate in this event.

Plenary Session

[Tuesday, May 13, 2014, 16:10-17:40] (at Room H of the Symposium Venue)

The Plenary Session will take place on the afternoon of Tuesday, May 13, 2014. Two distinguished speakers are invited to give presentations, which will hopefully give insight into the future of EMC technologies, rather than focusing on specific topics on EMC. The participants in EMC'14/Tokyo are cordially invited to this inspiring session before attending the "Welcome Reception."

Welcome Reception

[Tuesday, May 13, 2014, 17:40-19:30] (at Room A & B of the Symposium Venue)

Join us for the Welcome Reception at Symposium Venue.

All the registrants and their accompanying persons are invited to this event without any advanced reservation, where free drinks and light snacks will be served.

Keynote Session

[Wednesday, May 14, 2014, 11:10-12:40] (at Room H of the Symposium Venue)

This Keynote Session has been organized to provide an entire view on the latest research trends in EMC that spreads over almost all fields in technology, and features exciting speeches by three keynote speakers from USA, Europe and Asia, who are the most leading researchers and organizers of

the EMC in their different regions. The session will also serve as a platform for discussing the future of EMC researches in the world.

Banquet & Award Ceremony

[Thursday, May 15, 2014, 18:30-21:00] (at Josui Kaikan)

The social highlight of EMC'14/Tokyo is the Banquet & the Award Ceremony at Josui Kaikan, which is located next to the Symposium Venue.

The EMC'14/Tokyo Award Winners will be commended for their outstanding achievements there. The participants will also experience an exciting Japanese drum performance. Enjoy the dinner and admire the Award Winners with your colleagues and friends.

Each one of the participants for this event is required to have a Banquet Ticket (7,000 JPY/person), which were available on the Pre-Registration System on a first-come-first-served basis.

Technical Exhibition

[From Tuesday, May 13 to Friday, May 16, 2014, 9:30-17:00] (in the foyer on the 2nd floor of the Symposium Venue)

An exhibition area will be provided at the symposium venue from May 13 to 16, 2014, for EMC-related companies and organizations to display their latest products, equipment, instruments, services, publications, etc.

Also, some of the exhibitors will give a seminar during the lunch time at the Symposium Venue.,

<Exhibitors List>

- ADVANTEST CORP. (May 15 and 16)
- AET, INC. (May 13, 14, 15, and 16)
- AGILENT TECHNOLOGIES INC. (May 13, 14, 15, and 16)
- ANRITSU CORP. (May 15 and 16)
- AR RF/MICROWAVE INSTRUMENTATION
(May 13, 14, 15, and 16)
- ART-Fi / IMST / NEXTEM (May 13, 14, 15, and 16)
- DENKENSEIKI RESEARCH INSTITUTE CO., LTD.
(May 13 and 14)
- DENSO EMC ENGINEERING SERVICE CORP.
(May 13 and 14)
- ELSA JAPAN INC. (May 13, 14, 15, and 16)

- ETS-LINDGREN JAPAN, INC. (May 13 and 14)
- FUJITSU ADVANCED TECHNOLOGIES LTD.
(May 13 and 14)
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- ROHDE & SCHWARZ JAPAN (May 13, 14, 15, and 16)
- TOHOKU UNIVERSITY (May 15 and 16)
- TOYO CORP. (May 13 and 14)
- TOYO MEDIC CO., LTD. (May 13, 14, 15, and 16)

Memo

Plenary Session

Room H May 13, Tuesday 16:10-17:40

[Plenary Session: 13P2-H] New Horizon of EMC Research

Chairperson: Masao Taki (Tokyo Metropolitan University, Japan)

Co-Chairpersons: Hideaki Sone (Tohoku University, Japan), Takatoshi Shindo (Central Research Institute of Electric Power Industry, Japan)

13P2-H1P. A New Paradigm in ICT and the Role of EMC Research

Masao Sakauchi (National Institute of Information and Communications Technology, Japan)

【Biography】

Dr. Masao Sakauchi was appointed President of the National Institute of Information and Communications Technology (NICT), Japan in April 2013. As President of the NICT, Dr. Sakauchi's major research area is multimedia data processing techniques for images and videos, especially cutting-edge research in object recognition. Dr. Sakauchi's professional career started as a full-time lecturer in the Department of Electrical Engineering at the University of Tokyo, Japan in 1975. He joined the University of California, USA as a researcher in 1987. In 1998, he was appointed to Director General of the Institute of Industrial Science at the University of Tokyo. In 2002, he joined the National Institute of Informatics and was appointed Director General in 2005. Dr. Sakauchi holds a Ph.D. in Electronics Engineering and is a professor emeritus at the University of Tokyo. He has also been awarded the Ericsson Telecommunication Award (2010) and the National Order of the Legion of Honour (Chevalier, awarded by the French Republic, 2012).



13P2-H2P. EMC Applications of Electromagnetic Time Reversal

Farhad Rachidi (Swiss Federal Institute of Technology, Switzerland)

【Biography】

Farhad Rachidi (IEEE Fellow, EMP Fellow) is currently a Titular Professor and the head of the EMC Laboratory at the Swiss Federal Institute of Technology (EPFL). Dr. Rachidi is currently the Editor-in-Chief of the IEEE TRANSACTIONS ON ELECTROMAGNETIC COMPATIBILITY, the President of the International Conference on Lightning Protection (ICLP) and the President of the Swiss National Committee of the International Union of Radio Science (URSI). He is the author or coauthor of more than 120 scientific papers published in peer-reviewed journals and over 250



papers presented at international conferences. He was the recipient of several distinctions, in particular the 2005 IEEE EMC Society Technical Achievement Award, the 2005 CIGRE Technical Committee Award. In 2006, he was awarded the Blondel Medal from the French Association of Electrical Engineering, Electronics, Information Technology and Communication (SEE).

Keynote Session

Room H May 14, Wednesday 11:10-12:40

[Keynote Session: 14A2-H] Overview of EMC Research Trends

Chairperson: Osamu Fujiwara (Nagoya Institute of Technology, Japan)

14A2-H1K. EMC Research Trends in the USA

Robert Scully (NASA, USA/President of IEEE EMC Society)
【Biography】

Dr. Scully has over 30 years of experience in military and commercial aviation, with experience ranging from weapons research and development to design and technical support of helicopter electrical and avionic systems to engineering design, requirements development, and real time anomaly resolution for Space Shuttle and Space Station systems support.

Since June 2000, Dr. Scully has served as the NASA Johnson Space Center Electromagnetic Compatibility (EMC) Group Lead Engineer. In that role, Dr. Scully is the technical lead for EMC at the Center, provides technical management of the EMI laboratory facility at the Center, and provides support to multiple NASA programs. Dr. Scully is also the lead for the Community of Practice for EMC within NASA.

Dr. Scully was recently elevated to IEEE Fellow for contributions to the protection of aerospace systems from lightning and electromagnetic interference, and is currently serving as President of the IEEE EMC Society.



14A2-H2K. EMC Research Trends in Europe

Marcello D'Amore (Sapienza University of Rome, Italy)
【Biography】

Marcello D'Amore is professor emeritus of Electrotechnics and Electromagnetic Compatibility at Faculty of Engineering of the Sapienza University of Rome where he was the first head of the Electrical Engineering Department in 1983. He has published more than 150 papers in the field of electromagnetic compatibility (EMC), nanotechnology and power line communication. Current research interests include nano-



interconnects, transparent nano-structured shields, nano-inductors, and HIRF/LEMP interaction to aircraft. He was co-founder of the International Symposium EMC Europe in 1994, Guest Editor of two Special Issues, Editor-in-Chief (2000-2003) and member of the Advisory Board of IEEE Transactions on EMC. He received awards from IEEE EMC Society and from SAE. He is Fellow of IEEE since 1990, life Fellow since 2010.

14A2-H3K. Overview of EMC related Issues in Japan and Vicinity


Liuji R. Koga (Okayama University, Japan)
【Biography】

Born 1945 in Tokyo, and grown in Mt. Unzen, then in Himeji till his high school days. Graduated from Kyoto University as well as its Graduate School. Dr. Engineering in Electrical Engineering. He was with Atomic Energy Institute, Kyoto University, and then with Okayama University. He met EMC problems in the research of laser application. Professor Emeritus of Okayama University. Past President of EMCJ, subsidiary of IEICE, Japan, and was the chair of "EMC Symposium 2009/Kyoto". Present member of BoD, IEEE EMCS. He is now conducting a private company, "EM Consulting Ltd."



Memo

Technical Program

 :EMC'14/Tokyo Award Nominee

Room H May 13, Tuesday 10:00-11:20

[13A1-H] Numerical Modeling (1)

Chairperson: Kazuhiro Takaya (Nippon Telegraph and Telephone Corp., Japan)

13A1-H1. Inductance Extraction of a Meander Line on a Coplanar Plane using Partial Element Method

B. Pu, K. Kim, W. Nah (Sungkyunkwan University, Korea)

13A1-H2. Software-related EMI Model Reduction for Two-stage Pipeline Microcontroller

S.-Y. Yuan¹, M. S. Lin² (¹Feng Chia University, Taiwan, ²Bureau of Standards, Metrology and Inspection, Taiwan)

13A1-H3. Analysis of Emission From a Slot Nearby a Microstrip Line on a Printed Circuit Board

T. Tobana, T. Sasamori, Y. Isota (Akita Prefectural University, Japan)

13A1-H4. Electromagnetic Compatibility Concepts at Nanoscale

V. Mordachev¹, E. Sinkevich¹, G. Slepyan², A. Boag², S. Maksimenko³, P. Kuzhir³, G. Miano⁴, M. Portnoi⁵, A. Maffucci⁶ (¹Belarusian State University of Informatics and Radioelectronics, Belarus, ²Tel-Aviv University, Israel, ³Belarusian State University, Belarus, ⁴University of Naples Federico II, Italy, ⁵University of Exeter, United Kingdom, ⁶University of Cassino and Southern Lazio, Italy)

Room H May 13, Tuesday 11:40-13:00

[13A2-H] Numerical Modeling (2)

Chairperson: Wansoo Nah (Sungkyunkwan University, Korea)


13A2-H1. Numerical Modeling of ESD Events Including Both Charging and Discharging Processes with FDTD-SPICE Direct Linking Solver

K. Fujita (Fujitsu Limited, Japan)

13A2-H2. Determination of EM Coupling on an Electrical Wiring Interconnection System Application of Condensation Approaches on Cable Models

M. Ridel, J. P. Parmantier (ONERA - the French Aerospace Lab, France)

13A2-H3. EMC/EMI Problems and Diffraction Modeling: Finite Difference Time Domain vs. Method of Moments

 L. Sevgi¹, G. Apaydin², M. A. Uslu¹ (¹Dogus University, Turkey, ²Zirve University, Turkey)

13A2-H4. Discrete Optimization of EMI Filter Using a Genetic Algorithm

M. Ferber¹, R. Mrad^{1,2}, F. Morel¹, C. Vollaire¹, G. Pillonnet², A. Nagari³, J. Vasconcelos⁴ (¹Laboratoire Ampère (CNRS UMR5005), France, ²CPE INL (CNRS UMR5270), France, ³Advanced Audio Design, AMS BU ST Ericsson, France, ⁴Universidade Federal de Minas Gerais, Brazil)

Room H May 13, Tuesday 14:30-15:50

[13P1-H] Numerical Modeling (3)

Chairperson: Nobuo Kuwabara (Kyushu Institute of Technology, Japan)

13P1-H1. Three-Dimensional Dipole Source Identification Using Two Fixed Receiving Antennas and Its New Algorithm

A. Nishikata, Y. Wada, M. Tawada, Y. Takabe (Tokyo Institute of Technology, Japan)

13P1-H2. Simulation Objects to be used as Unintentional Radiators

B. Menssen, F. Burghardt, H. Garbe (Leibniz Universität Hannover, Germany)

13P1-H3. Study on Charge Oscillation-Induced Low-Frequency Electric Field

K. Kikunaga, H. Yamashita, M. Egashira, K. Nonaka (National Institute of Advanced Industrial Science and Technology, Japan)

13P1-H4. Research on the Simulation System of the Complex Electromagnetic Environment

L. M. Chen, D. Shi, Y. G. Gao (Beijing University, China)

Room A May 13, Tuesday 10:00-11:20

[13A1-A] Power Electronics & Vehicles (1)

Chairperson: Masahito Shoyama (Kyushu University, Japan)

Co-Chairperson: Naoto Oka (Mitsubishi Electric Corp., Japan)

13A1-A1. Investigation of Relation between Switch Timing Difference and Common-mode Voltage on Cable

T. Uchida¹, N. Kuwabara¹, H. Sato² (¹Kyushu Institute of Technology, Japan, ²Daiwa Industries Ltd., Japan)

13A1-A2. Inductive Coupling Matrix of a Multiconductor System for a Winding-on-Core Prototype

F. Abdallah, M. Alaküla (Lund University, Sweden)

13A1-A3. Conductive Noise Analysis of Inverter Circuits for Vehicle Equipments Using an Equivalent Circuit

Y. Shiraki, Y. Sasaki, N. Oka (Mitsubishi Electric Corp., Japan)

13A1-A4. Common-Mode Noise Reduction with Two Symmetrical Three-Phase Inverters

X. C. Zhang, M. Shoyama (Kyushu University, Japan)

Room A May 13, Tuesday 11:40-13:00

[13A2-A] Power Electronics & Vehicles (2)

Chairperson: Naoto Oka (Mitsubishi Electric Corp., Japan)

Co-Chairperson: Masahito Shoyama (Kyushu University, Japan)

13A2-A1. Calculation of Interference between Railway Traction Inverters and Balises

S. Hatsukade¹, A. Yamanaka² (¹Railway Technical Research Institute, Japan, ²West Japan Railway Company, Japan)

13A2-A2. Experimental Evaluation on Time Variation of Conducted Noise Spectrum for a PFC Converter



T. Ibuchi, R. Kamikomaki, T. Funaki (Osaka University, Japan)

13A2-A3. A Study of Common Mode Noise Current of Bridgeless PFC Circuit Considering Voltage Change in Y-Capacitors



K. Shi¹, S. Tomioka², M. Shoyama¹ (¹Kyushu University, Japan, ²TDK Lambda, Japan)

13A2-A4. Impact of Thermal Aging on Emission of a Buck DC-DC Converter

A. Boyer, H. Huang, S. Bendhia (LAAS-CNRS, France)

Room A May 13, Tuesday 14:30-15:50

[13P1-A] EMC Management and Standards

Chairperson: Yukio Yamanaka (The Telecommunication Technology Committee, Japan)

13P1-A1. Research of Test Site Validation by using Reference Site Method Frequency Range of 9 kHz to 30 MHz Validation for Test Site by accroding to CISPR 16-1-4 Document

S. Lee¹, N. Kim¹, H. S. Keum², B. H. Kim², S. H. Choi², J. K. Yang³ (¹Chungbuk National University, Korea, ²Korea Radio Promotion Association, Korea, ³National Radio Research Agency, Korea)

13P1-A2. Consideration for Evaluation Method of Proficiency Test Program on EMI Measurement

K. Osabe, T. Kato (Voluntary EMC Laboratory Accreditation Center Inc., Japan)

13P1-A3. Use of FFT-based Measuring Instruments for EMI Compliance Measurements

J. Medler (Rohde & Schwarz GmbH & Co. KG, Germany)

13P1-A4. Timing Considerations using FFT-based Measuring Receivers for EMI Compliance Measurements

J. Medler¹, C. Reimer² (¹Rohde & Schwarz GmbH & Co. KG, Germany, ²Rohde & Schwarz International Operations GmbH, Germany)

Room B May 13, Tuesday 10:00-13:00

[Organized Session: 13A-B] Signal Integrity and Unintentional EM Radiation Related to Printed Circuit Boards

Organizers: Yoshiki Kayano (Akita University, Japan), Yoshitaka Toyota (Okayama University, Japan), and Tzong-Lin Wu (National Taiwan University, Taiwan)

Chairpersons: Yoshitaka Toyota (Okayama University, Japan) / Yoshiki Kayano (Akita University, Japan)

Co-Chairperson: Tzong-Lin Wu (National Taiwan University, Taiwan)


- 13A-B1. Generalized Debye Model for PCB Dielectrics and Conductors**
A. E. Engin, E. Kozachenko (San Diego State University, USA)
- 13A-B2. Evaluation Method of Balance Mismatch Using CMRR Measurement for Printed Circuit Board**
M. Shimazaki¹, H. Asai² (¹Mitsubishi Electric Corp., Japan, ²Research Institute of Electronics Shizuoka University, Japan)
- 13A-B3. Application of the MREMC Algorithms for Performance-Based Circuit Board Design**
T. H. Hubing, C. Zhu (Clemson University, USA)
- 13A-B4. A Metamaterial-Inspired and Embedded Structure to Damp the Resonance of the Power/Ground Planes**
S. Kahng¹, K. Jang¹, J. Jeon¹, H. Oh² (¹Incheon National University, Korea, ²Innertron Ltd., Co., Korea)
- 13A-B5. Identifying Dominant Factor of Imbalance Component and EM Radiation from Differential-Paired Lines with Serpentine Equal-Length Routing**
Y. Kayano¹, H. Inoue² (¹Akita University, Japan, ²The Open University of Japan, Japan)
- 13A-B6. Modal Equivalent Circuit of Bend Discontinuity in Differential Transmission Lines**
Y. Toyota, S. Kan, K. Iokibe (Okayama University, Japan)
- 13A-B7. Signal Integrity: Influence of Non-linear Driver, Different Bit Rates, and Estimation by Different Algorithms**
S.-Y. Hsu, C.-C. Chou, T.-L. Wu (National Taiwan University, Taiwan)

Room B May 13, Tuesday 14:30-15:50

[13P1-B] Chip, Package, PCB & Cables (1)

Chairperson: Sungtek Kahng (Incheon National University, Korea)

Co-Chairperson: Teruo Tobana (Akita Prefectural University, Japan)

- 13P1-B1. Imbalance Control by Open Stub for Reduction of Common-Mode Conversion at Differential Transmission Line Bend**
 T. Matsushima, O. Wada (Kyoto University, Japan)

13P1-B2. Suppression of Mode Conversion by Decreasing Path Difference by using an Asymmetrically Tapered Bend in Differential Transmission Lines

S. Kan¹, Y. Toyota¹, K. Iokibe¹, T. Watanabe² (¹Okayama University, Japan, ²Industrial Technology Center of Okayama Prefecture, Japan)

13P1-B3. Weak-Coupled Cross-Sectional Differential-Paired Lines with Bend Discontinuities for SI and EMI Performances

Y. Kayano¹, M. Ohkoshi¹, H. Inoue² (¹Akita University, Japan, ²The Open University of Japan, Japan)

Room S May 13, Tuesday 10:00-13:00

[Organized Session: 13A-S] Electromagnetic Phenomena Associated with Earthquakes: Earthquake Prediction

Organizers: Masashi Hayakawa (University of Electro-Communications, Japan) and Katsumi Hattori (Chiba University, Japan)

Chairperson: Masashi Hayakawa (University of Electro-Communications, Japan)

Co-Chairperson: Katsumi Hattori (Chiba University, Japan)

13A-S1. ULF Geomagnetic Anomalous Changes Related to Large Earthquakes : Case and Statistical Studies

K. Hattori, P. Han, M. Hirokawa, C. Yoshino (Chiba University, Japan)

13A-S2. Physics of Electromagnetic Phenomena associated with the Rupture of a Finite Fault Model

Q. H. Huang¹, H. X. Ren², D. Zhang¹ (¹Peking University, China, ²University of Science and Technology of China, China)

13A-S3. Ultra-Low-Frequency Magnetic Field Depression for Three Huge Oceanic Earthquakes in Japan and in the Kurile Islands

A. Schekotov¹, M. Hayakawa² (¹Russian Academy of Sciences, Russia, ²University of Electro-Communications, Japan)

13A-S4. Detections of Electromagnetic Waves Excited by Earthquakes

M. Tsutsui (Kyoto Sangyo University, Japan)

13A-S5. Stochastic Relation between the Line-of-sight VHF Propagation and Earthquakes

K. Motojima, N. Haga (Gunma University, Japan)

13A-S6. Seismo-Ionospheric Perturbations, and the Precursors to the 2011 Japan Earthquake

M. Hayakawa (University of Electro-Communications, Japan)

13A-S7. Preseismic Lithosphere-Atmosphere-Ionosphere Coupling Associated With Earthquake Preliminary Mission Analysis for Nano-Satellite Observation

M. Kamogawa, Y. Orihara, M. Nakamura, Y. Suto, S. Togo, R. Tanaka (Tokyo Gakugei University, Japan)

Room S May 13, Tuesday 14:30-15:50

[13P1-S] Biological Effects, EMF Safety & EMC in Medical Applications and Safety (1)

Chairperson: Takashi Hikage (Hokkaido University, Japan)

13P1-S1. Analysis of Body Hair Movement in ELF Electric Field Exposure—For Mechanism of Seasonal Change in Perception Threshold—

H. O. Shimizu¹, K. Shimizu² (¹Hokkaido Institute of Technology, Japan, ²Hokkaido University, Japan)

13P1-S2. Effect of Two-times 24 hour Exposures to 60 GHz Millimeter-waves on Neurite Outgrowth in PC12VG Cells in Consideration of Polarization

T. Shiina¹, Y. Suzuki¹, Y. Kasai¹, Y. Inami¹, K. Wake², M. Taki¹ (¹Tokyo Metropolitan University, Japan, ²National Institute of Information and Communications Technology, Japan)

13P1-S3. Effect of 915 MHz RFID Exposure on Changes of Body Temperature in Rats

H. S. Kim¹, Y. H. Lee¹, A. K. Lee², H. D. Choi², Y.-S. Lee³, J.-K. Park⁴, N. Kim⁵, Y. H. Ahn¹ (¹Ajou University School of Medicine, Korea, ²Electronics and Telecommunications Research Institute, Korea, ³Ewha Woman's University, Korea, ⁴Chungnam National University, Korea, ⁵Chungbuk National University, Korea)

13P1-S4. Relationship between Spatial-Averaged SAR and Temperature Elevation in Human Head Models from 1–10 GHz



A. Hirata, S. Ohta, I. Laakso, O. Fujiwara (Nagoya Institute of Technology, Japan)

Room H May 14, Wednesday 09:30-10:50

[14A1-H] Numerical Modeling/Biological Effects

Chairperson: Tongning Wu (China Academy of Telecommunication Research, China)

14A1-H1. Estimation of the Electromagnetic Fields Excited by a Cellular Phone in a Typical Aircraft Cabin

M. Shirafune¹, T. Hikage¹, T. Nojima¹, S. Futatsumori², A. Kohmura², N. Yonemoto² (¹Hokkaido University, Japan, ²Electronic Navigation Research Institute, Japan)

14A1-H2. Millimeter-Wave Power Absorbed into Rabbit Eye Due to Different Exposure Environments

J. Chakarothai^{1,2}, Y. Suzuki¹, M. Taki¹, M. Kojima³, K. Sasaki², K. Wake², S. Watanabe² (¹Tokyo Metropolitan University, Japan, ²National Institute of Information and Communications Technology, Japan, ³Kanazawa Medical University, Japan)

14A1-H3. Comparison of SAR in Human Body Radiated from Mobile Phone and Tablet Computer

A. Tateno¹, K. Tanaka¹, T. Nagaoka², K. Saito¹, S. Watanabe², M. Takahashi¹, K. Ito¹ (¹Chiba University, Japan, ²National Institute of Information and Communications Technology, Japan)

14A1-H4. Numerical Modeling and Dosimetry of Pregnant Females at Various Stages of Pregnancy

T. Nagaoka¹, T. Niwa², S. Watanabe¹ (¹National Institute of Information and Communications Technology, Japan, ²Tokai University School of Medicine, Japan)

Room H May 14, Wednesday 14:00-16:00

[14P1-H] Biological Effects, EMF Safety & EMC in Medical Applications and Safety (2)

Chairperson: Peter Sai Wing Leung (City University of Hong Kong, Hong Kong)

Co-Chairperson: Ilkka Laakso (Nagoya Institute of Technology, Japan)

14P1-H1. A Study on Exposure Level Measurement of the IH Cooker

K. Sato¹, Y. Kamimura² (¹Tohoku Gakuin University, Japan, ²Utsunomiya University, Japan)

14P1-H2. Exposure Assessment for a Wireless Multi-phone Charger

W. G. Kang¹, A. I. Zhbanov², H. Y. Jun³, Y. H. Park³, J. K. Pack¹ (¹Chungnam National University, Korea, ²Electromagnetic Environment Research Center, Korea, ³SAMSUNG Electronics, Korea)

14P1-H3. Computational Dosimetry for Wireless Charging of an Electrical Vehicle

I. Laakso, A. Hirata, O. Fujiwara (Nagoya Institute of Technology, Japan)

14P1-H4. Numerical Evaluation of Exposure to the Electromagnetic Fields of an Electronic Article Surveillance System with Postured Infant Model

C. Li^{1,2}, T. Wu² (¹University of Science and Technology Beijing, China, ²China Academy of Telecommunication Research, China)

14P1-H5. Dosimetry for Two modes of Resonance-based Wireless Power Transfer System

S. W. Park¹, E. H. Kim¹, K. Wake², S. Watanabe² (¹Korea Automotive Technology Institute, Korea, ²National Institute of Information and Communications Technology, Japan)

14P1-H6. Electromagnetic Interference with Medical Devices from Third Generation Mobile Phone Including LTE

S. Ishihara¹, J. Higashiyama¹, T. Onishi¹, Y. Tarusawa¹, K. Nagase² (¹NTT DOCOMO, INC., Japan, ²Kanazawa University Hospital, Japan)

Room H May 14, Wednesday 16:20-18:40

[Organized Session: 14P2-H] Active Implantable Medical Device EMI

Organizer: Takashi Hikage (Hokkaido University, Japan)

Chairperson: Niels Kuster (ETH-Zurich, Switzerland)

Co-Chairperson: Toshio Nojima (Hokkaido University, Japan)

- 14P2-H1. A New Improved Electrode for the Human Body Model: Application for EMI Assessment of Active Implant Medical Devices**
H. Fujimoto¹, T. Toyoshima¹, T. Hikage², T. Nojima² (¹Medtronic Japan Co., Ltd., Japan, ²Hokkaido University, Japan)
- 14P2-H2. Implantable Cardiac Pacemaker EMI Triggered by HF-band Wireless Power Transfer Coils**
T. Hikage, M. Shirafune, T. Nojima (Hokkaido University, Japan)
- 14P2-H3. Study of Effects of Commercial Shielding Products Attached to Mobile Phone on Human Body with Implanted Medical Device**
Y. L. Diao, W. N. Sun, K. H. Chan, S. W. Leung, Y. M. Siu (City University of Hong Kong, Hong Kong)
- 14P2-H4. Platform for the Modeling of In Vivo Effects Relevant to Implant EM Exposure Safety**
E. Neufeld, N. Kuster (IT'IS Foundation, Switzerland)
- 14P2-H5. Reconsideration of EMI Phenomenon in Active Implantable Medical Devices in the Age of MR Conditional Devices**
T. Toyoshima (USCI Holdings, Inc., Japan)
- 14P2-H6. Safety Assessment of AIMDs under MRI Exposure: Tier3 vs. Tier4 Evaluation of Local RF-induced Heating**
E. Cabot¹, E. Zastrow^{1, 2}, N. Kuster^{1, 2} (¹IT'IS Foundation, Switzerland, ²ETH Zurich, Switzerland)
- 14P2-H7. Piece-wise Excitation System for the Characterization of Local RF-Induced Heating of AIMD during MR Exposure**
E. Zastrow^{1, 2}, M. Capstick¹, E. Cabot¹, N. Kuster^{1, 2} (¹IT'IS Foundation, Switzerland, ²ETH Zurich, Switzerland)

Room A May 14, Wednesday 09:30-12:30

[Organized Session: 14A-A] Improving the Measurement Uncertainty of EMI Testing

Organizer: Toshiki Shimasaki (VCCI, Japan)

Chairperson: Fujio Amemiya (NTT Advanced Technology Corp., Japan)

Co-Chairperson: Andy Griffin (Cisco Systems Inc, USA)

- 14A-A1. Main Objective of this Organized Session "Improving the measurement uncertainty of EMI testing"**
K. Osabe (Voluntary EMC Laboratory Accreditation Center Inc., Japan)

14A-A2. Reducing the Standard Compliance Uncertainty by using Ferrite Type CMADs during Radiated Disturbance Measurements Acc. to CISPR 16-2-3

J. Medler (Rohde & Schwarz GmbH & Co. KG, Germany)

14A-A3. Measurement Method, Uncertainty and Cable Balance - with Implications for the CDNE-M

D. M. Lauder¹, R. C. Marshall² (¹University of Hertfordshire, United Kingdom, ²Richard Marshall Limited, United Kingdom)

14A-A4. Improvement of Radiated Emission Measurement Reproducibility by VHF-LISN - Interim Results of International Inter-Laboratory Comparison -

S. Okuyama¹, K. Tanakajima², K. Osabe³, H. Muramatsu⁴ (¹NEC AccessTechnica, Ltd., Japan, ²Intertek Japan K.K., Japan, ³Voluntary EMC Laboratory Accreditation Center Inc., Japan, ⁴VCCI Council, Japan)

14A-A5. A Case Study on the Consistency Improvement in Radiated-Emission Testing by Using LISN

Y. Tang¹, J. Chen¹, C. Lee², C. Chiu³ (¹Bureau of Standards, Metrology and Inspection (BSMI), Taiwan, ²Electronics Testing Center, Taiwan, ³Da-Yeh University, Taiwan)

14A-A6. Influence of Termination Impedance to Radiated Emission from AC Cable with Ferrite Cores Array below 300 MHz

N. Kuwabara¹, T. Nakanushi¹, K. Osabe², H. Muramatsu³ (¹Kyushu Institute of Technology, Japan, ²Voluntary EMC Laboratory Accreditation Center, Japan, ³VCCI Council, Japan)

14A-A7. Asymmetric Artificial Networks (AAN) for Balanced Telecommunications Cables Conducted Common Mode Emissions Testing

B. L. Harlacher (Fischer Custom Communications, Inc., USA)

14A-A8. Impact of table materials on measurements up to 18 GHz

A. Griffin (Cisco Systems Inc., USA)

Room A May 14, Wednesday 14:00-16:00

[Organized Session: 14P1-A] Metrological Approach for Result Validation and Improvement of Measurement Quality

Organizer: Takehiro Morioka (National Institute of Advanced Industrial Science and Technology (AIST), Japan)

Chairperson: David Novotny (National Institute of Standards and Technology, USA)

Co-Chairperson: Katsumi Fujii (National Institute of Information and Communications Technology, Japan)

14P1-A1. Uncertainties in sVSWR and A Proposal for Improvement Using Vector Response Measurements

Z. Chen (ETS-Lindgren, USA)

14P1-A2. Effects of Incident Directions on Reflection Coefficients of Pyramidal Electromagnetic Wave Absorber

T. Aoyagi¹, K. Kurihara², T. Takizawa², Y. Hirai² (¹Tokyo Institute of Technology, Japan, ²TDK Corp., Japan)

14P1-A3. Propagation Characteristics of Data Communication System for Protection and Disaster Relief Operations Using TV White Space

M. Noda, T. Yukimatsu, T. Kinoshita, M. Shida (Hitachi, Ltd., Japan)

14P1-A4. Electromagnetic Wave Source Visualization System with Lüneburg Lens

A. Ohmae, I. Hoda, U. Paoletti, W. Li, T. Suga, H. Osaka (Hitachi Ltd., Japan)

14P1-A5. Loop Antenna Calibration Methods in Low-frequency

M. Ishii¹, K. Fujii² (¹National Institute of Advanced Industrial Science and Technology, Japan, ²National Institute of Information and Communications Technology, Japan)

14P1-A6. A Look at the Emissions of Three Low-Power Wireless Charging Devices

D. Novotny (National Institute of Standards and Technology, USA)

Room A May 14, Wednesday 16:20-18:20

[Organized Session: 14P2-A] EM Information Leakage

Organizer: Yu-ichi Hayashi (Tohoku University, Japan)

Chairperson: William A. Radasky (Metatech Corporation, USA)

Co-Chairperson: Tetsuya Tominaga (Nippon Telegraph and Telephone, Japan)

14P2-A1. Efficient Method for Estimating Propagation Area of Information Leakage via EM Field

Y. Hayashi, N. Homma, T. Mizuki, T. Aoki, H. Sone (Tohoku University, Japan)

14P2-A2. Analysis on Equivalent Current Source of AES-128 Circuit for HD Power Model Verification

K. Iokibe¹, K. Maeshima¹, T. Watanabe², H. Kagotani¹, Y. Nogami¹, Y. Toyota¹ (¹Okayama University, Japan, ²Industrial Technology Center of Okayama Prefecture, Japan)

14P2-A3. Correlation Power Analysis using Bit-Level Biased Activity Plaintexts against AES Cores with Countermeasures

D. Fujimoto¹, N. Miura¹, M. Nagata¹, Y. Hayashi², N. Homma², T. Aoki², Y. Hori³, T. Katashita³, K. Sakiyama⁴, T. Le⁵, J. Bringer⁵, P. Bazargan-Sabet⁶, S. Bhasin⁷, J. Danger⁷ (¹Kobe University, Japan, ²Tohoku University, Japan, ³National Institute of Advanced Industrial Science and Technology, Japan, ⁴The University of Electro-Communications, Japan, ⁵Morpho, France, ⁶Pierre-and-Marie-Curie University, France, ⁷Telecom ParisTech, France)

14P2-A4. NICV: Normalized Inter-Class Variance for Detection of Side-Channel Leakage

S. B. Bhasin¹, J. Danger^{1,2}, S. Guilley^{1,2}, Z. Najm¹ (¹TELECOM-ParisTech, France, ²Secure-IC S.A.S., France)

14P2-A5. Chosen-message Electromagnetic Analysis against Cryptographic Software on Embedded OS

H. Uno, S. Endo, Y. Hayashi, N. Homma, T. Aoki (Tohoku University, Japan)

14P2-A6. Malicious Wave: a Survey on Actively Tampering Using Electromagnetic Glitch

S. Bhasin¹, P. Maistri², F. Regazzoni³ (¹Telecom ParisTech, France, ²University Grenoble, France, ³ALaRI - University of Lugano, Switzerland)

Room B May 14, Wednesday 09:30-10:50


[14A1-B] Chip, Package, PCB & Cables (2)

Chairperson: Arif E. Engin (San Diego State University, USA)
Co-Chairperson: Yasuhiro Shiraki (Mitsubishi Electric Corp., Japan)

14A1-B1. Modeling of Differential Line Across a Ground Slot

F. Xiao, Y. Kami (The University of Electro-Communications, Japan)

14A1-B2. Enhanced Passive Equalizer Using the Open Stub Compensation Technique

 S.-H. Huang¹, C.-W. Kuo¹, C.-C. Wang², T. Kitazawa³ (¹National Sun Yat-Sen University, Taiwan, ²Advanced Semiconductor Engineering Inc., Taiwan, ³Ritsumeikan University, Japan)

14A1-B3. A Novel S-Bridged Power Plane With Ultra Wideband Suppression of Ground Bounce Noise Using Open Stub

M. H. Lu¹, C. Wang², C. Kuo¹, T. Kitazawa³ (¹National Sun Yat-Sen University, Taiwan, ²Advanced Semiconductor Engineering Inc., Taiwan, ³Ritsumeikan University, Japan)

14A1-B4. Radiated Emission of Various PDN Designs


O. V. Tereshchenko¹, F. J. K. Buesink¹, F. B. J. Leferink^{1,2} (¹University of Twente, The Netherlands, ²Thales Nederland B.V., The Netherlands)

Room B May 14, Wednesday 11:10-12:30

[14A2-B] Chip, Package, PCB & Cables (3)

Chairperson: Frank Leferink (THALES - University of Twente, The Netherlands)
Co-Chairperson: Takashi Kasuga (Nagano National College of Technology, Japan)

14A2-B1. Forward Wave Analysis for EMC Power Supply Design above 1 GHz

 U. Paoletti, Y. Komiya, T. Suga, H. Osaka (Hitachi, Ltd., Japan)

14A2-B2. Reduction Technique for Power Supply Noise of Analog-Digital Mixed Circuit Boards -Adjustment of Attached Resistor Method-

S. Baba, S. Sasaki (Saga University, Japan)

14A2-B3. A Low Cost Capacitor Approach for Suppressing Resonance in Power Distribution Networks

K. Yamanaga¹, H. Yamamoto¹, T. Sato² (¹Murata Manufacturing Co., Ltd., Japan, ²Kyoto University, Japan)

14A2-B4. The Analysis of EMI Noise Coupling Mechanism for GPS Reception Performance Degradation from SSD/USB Module

H.-N. Lin¹, C.-C. Lu¹, H.-Y. Tsai¹, T.-W. Kung² (¹Feng-Chia University, Taiwan, ²Bureau of Standards, Metrology & Inspection, M.O.E.A, Taiwan)

Room B May 14, Wednesday 14:00-16:00

[Organized Session/Workshop: 14P1-B] IC Chip Level EMC for Telecommunication

Organizer: Masahiro Yamaguchi (Tohoku University, Japan)

Chairperson: Masahiro Yamaguchi (Tohoku University, Japan)

14P1-B1W. Through Silicon Via (TSV) Noise Coupling Effects on RF LC-VCO in 3D IC

J. Lim, J. Cho, M. Lee, B. Bae, J. Kim (Korea Advanced Institute of Science and Technology, Korea)

14P1-B2W. Measurements and Simulation of RF Noise Coupling and Its Impacts on LTE Wireless Communication Performance

M. Nagata¹, S. Shimazaki¹, N. Azuma¹, N. Miura¹, S. Muroga², Y. Endo², S. Tanaka², M. Yamaguchi² (¹Kobe University, Japan, ²Tohoku University, Japan)

14P1-B3W. Development of Micro Magnetic Field Probe to Evaluate Near Field on RFIC Chip

Y. Endo¹, M. Yamaguchi^{1,2}, Y. Shigeta¹, M. Onishi¹, K. Arai¹, S. Muroga¹ (¹Graduate School of Engineering, Tohoku University, Japan, ²New Industry Creation Hatchery Center, Tohoku University, Japan)

14P1-B4. On-Chip Magnetic Thin-Film Noise Suppressor for IC Chip Level Digital Noise Countermeasure

M. Yamaguchi¹, Y. Endo¹, S. Tanaka¹, T. Ito¹, S. Muroga¹, N. Azuma², M. Nagata² (¹Tohoku University, Japan, ²Kobe University, Japan)

14P1-B5. Evaluation and Analysis of Electromagnetic Noise Coupling in a Board with a Mixed Signal IC

K. Tsukamoto, M. Iwanami, E. Hankui (NEC Corporation, Japan)

Room B May 14, Wednesday 16:20-18:20

[Organized Session: 14P2-B] 3D-IC and Packages

Organizers: Joung-ho Kim (Korea Advanced Institute of Science and Technology, Korea) and Er Ping Li (Institute of High Performance Computing, Singapore)

Chairperson: Joung-ho Kim (Korea Advanced Institute of Science and Technology, Korea)

Co-Chairperson: Er Ping Li (Institute of High Performance Computing, A-Star, Singapore)

14P2-B1. In-Stack Monitoring of Signal and Power Nodes in Three Dimensional Integrated Circuits

Y. Araga, R. Miura, N. Ueda, N. Miura, M. Nagata (Kobe University, Japan)

14P2-B2. SI/PI Co-simulation including Voltage Regulating Circuitry for High-Performance Multi-Chip Package

J. H. Lim, J. J. Lee, S. Y. Jung (Samsung Electronics, Korea)

14P2-B3. Measurement and Analysis of Wireless Power Distribution Network using Magnetic Field Resonance in 3D Package and IC

E. S. Song, D. Jung, Y. Kim, J. Kim (KAIST, Korea)

14P2-B4. Crosstalk Reduction in TSV Arrays with Direct Ohmic Contact between Metal and Silicon-substrate

D. C. Yang¹, E. P. Li¹, J. L. Li¹, X. C. Wei¹, J. Y. Xie², M. Swaminathan² (¹Zhejiang University, China, ²Georgia Institute of Technology, USA)

14P2-B5. Design of Compact and Low-EMI Waveguide Structures based on Through Glass Vias

X. C. Wei, X. Wang, D. Yang, J. Li, X. Wei (Zhejiang University, China)

14P2-B6. Designing Test Patterns for Effective Measurement of Typical TSV Pairs in a Silicon Interposer

Q. Wang¹, K. Shringarpure¹, J. Fan¹, C. Hwang², S. Pan³, B. Achir³ (¹Missouri University of Science and Technology, USA, ²Samsung, Korea, ³Cisco Systems, Inc., USA)

Room S May 14, Wednesday 09:30-12:30

[Workshop: 14A-S] Recent Lightning Current Data from Instrumented Towers

Organizers: Marcos Rubinstein (University of Applied Sciences of Western Switzerland, Switzerland) and Farhad Rachidi (Swiss Federal Institute of Technology (EPFL), Switzerland)

Chairperson: Farhad Rachidi (Swiss Federal Institute of Technology, Switzerland)

Co-Chairperson: Marcos Rubinstein (University of Applied Sciences of Western Switzerland HES-SO, Switzerland)

14A-S1W. Introduction to Lightning Current Measurements

M. Rubinstein¹, F. Rachidi² (¹University of Applied Sciences of Western Switzerland, Switzerland, ²Swiss Federal Institute of Technology, Lausanne, Switzerland)

14A-S2W. Lightning Measurements at the Gaisberg Tower in Austria

G. Diendorfer (Austrian Electrotechnical Association (OVE), Dept. ALDIS, Austria)

14A-S3W. Lightning Observations at Tokyo Skytree

T. Shindo (CRIEPI, Japan)

14A-S4W. The Peissenberg Tower in Germany

F. Heidler (University of the Federal Armed Forces, Munich, Germany)

14A-S5W. Säntis Tower in Switzerland

M. Paolone¹, M. Ruinsein², F. Rachidi¹ (¹Swiss Federal Institute of Technology, Lausanne, Switzerland, ²University of Applied Sciences of Western Switzerland, Switzerland)

Room S May 14, Wednesday 14:00-16:00

[14P1-S] High Power & High Voltage EMC

Chairperson: Ting Wu (Osaka University, Japan)

Co-Chairperson: Tomoo Ushio (Osaka University, Japan)

14P1-S1. Calculation of Electromagnetic Fields Inside a Building with Layered Reinforcing Bar Struck by Lightning Using the FDTD Method



A. Tatematsu¹, F. Rachidi², M. Rubinstein³ (¹Central Research Institute of Electric Power Industry, Japan, ²Swiss Federal Institute of Technology, Lausanne, Switzerland, ³University of Applied Sciences Western Switzerland, Switzerland)

14P1-S2. The Most Powerful Lightning Discharges in Winter Thunderstorms in Japan Sea Coast

T. Wu, S. Yoshida, T. Ushio (Osaka University, Japan)

14P1-S3. Lightning Surge Voltage Characteristics between the Ports of Telecommunications Equipment for FTTH Service

M. Shintaku, T. Masuda, K. Yano, Y. Honma, J. Kato (NTT Energy and Environment Systems Laboratories, Japan)

14P1-S4. VHF Radio Observations of Lightning Discharges on JEM-GLIMS

H. Kikuchi¹, T. Morimoto², T. Ushio¹, M. Sato³, A. Yamazaki⁴, M. Suzuki⁴ (¹Osaka University, Japan, ²Kinki University, Japan, ³Hokkaido University, Japan, ⁴Japan aerospace Exploration Agency, Japan)

14P1-S5. Current Intentional EMI studies in Europe with a Focus on STRUCTURES



G. S. van de Beek¹, F. B. J. Leferink^{1,2} (¹University of Twente, The Netherlands, ²Thales Nederland B.V., The Netherlands)

Room S May 14, Wednesday 16:20-17:40

[14P2-S] Power System EMC

Chairperson: Tsuyoshi Funaki (Osaka University, Japan)

14P2-S1. Electromagnetic Radiated Emissions from a Wireless Power

Transfer System using a Resonant Magnetic Field Coupling

S. Kong, J. Kim, B. Bae, J. J. Kim, S. Kim, J. Kim (KAIST, Korea)

14P2-S2. Short Range Wireless Power Charging on Small Electric Vehicles

W. Khan-ngern, H. Zenkner (King Mongkut's Institute of Technology Ladkrabang, Thailand)

14P2-S3. Harmonic Current Reduction Method of Hand-Held Resonant Magnetic Field Charger (HH-RMFC) for Electric Vehicle

C. Song, H. Kim, H. Jung, E. Song, S. Kim, J. Kim, J. Kim (Korea Advanced Institute of Science and Technology, Korea)

14P2-S4. Various Approaches to Problems of Multicriterion Optimization Processes of Electric Power Systems

N. V. Korovkin^{1,2}, M. V. Odintsov^{1,2}, N. A. Belyaev^{1,2}, O. V. Frolov², M. Hayakawa^{3,4} (¹Theoretical Electrical Engineering dept. St.Petersburg State Polytechnical University, Russia, ²Joint Stock Company «scientific and Technical Center of Unified Power System», Russia, ³Hayakawa Institute of Seismo Electromagnetics Co. Ltd., The University of Electro-Communications (UEC) Incubation Center, Japan, ⁴Advanced Wireless Communications Research Center and Research Station on Seismo Electromagnetics. UEC, Japan)

Room H May 15, Thursday 09:30-12:30

[Organized Session: 15A-H] EMC Aspects of Wireless Power Transfer Systems

Organizers: Mauro Feliziani (University of L'Aquila, Italy) and Seungyoung Ahn (Korea Advanced Institute of Science and Technology, Korea)

Chairperson: Mauro Feliziani (University of L'Aquila, Italy)

Co-Chairperson: Seungyoung Ahn (Korea Advanced Institute of Science and Technology, Korea)

15A-H1. Magnetic Shielding of Wireless Power Transfer Systems

T. Campi, S. Cruciani, M. Feliziani (University of L'Aquila, Italy)

15A-H2. Low Frequency Electromagnetic Compatibility of Wirelessly Powered Electric Vehicles

M. Kim¹, S. Kim¹, Y. Chun², S. Park², S. Ahn¹ (¹KAIST, Korea, ²Chungbuk National University, Korea)

15A-H3. Applicability of Quasistatic Approximation for Exposure Assessment of Wireless Power Transfer

I. Laakso¹, T. Shimamoto¹, A. Hirata¹, M. Feliziani² (¹Nagoya Institute of Technology, Japan, ²University of L'Aquila, Italy)

15A-H4. Analysis of Power Dissipation and Temperature Rise of an Inductive Link for Retinal Implants

D. C. Ng^{1,2}, E. Skafidas^{1,2} (¹National ICT Australia, Australia, ²University of Melbourne, Australia)

15A-H5. Undesired Emission from Coupled-Resonant Wireless Power Transfer Antenna for Fundamental and Harmonics Frequency

H. Hirayama, H. Yamada, N. Kikuma, K. Sakakibara (Nagoya Institute of Technology, Japan)

15A-H6. Investigation and Analysis on EMC Reduction with Impedance Matching Technique in Wireless Power Transfer System

F. Bien, S. Oruganti (School of ECE, UNIST, Korea)

15A-H7. Coexistence of Wireless Power Transfer via Microwaves and Wireless Communication for Battery-less ZigBee Sensors

N. Shinohara, T. Ichihara (Kyoto University, Japan)

15A-H8. Induced Field and SAR in Human Body Model Due to Wireless Power Transfer System with Induction Coupling

T. Sunohara¹, I. Laakso¹, A. Hirata¹, T. Onishi² (¹Nagoya Institute of Technology, Japan, ²NTT DOCOMO, INC., Japan)

Room H May 15, Thursday 14:00-17:00

[Organized Session/Workshop: 15P-H] Automotive EMC

Organizer: Mauro Feliziani (University of L'Aquila, Italy)

Chairperson: Mauro Feliziani (University of L'Aquila, Italy)

Co-Chairperson: Todd Hubing (Clemson University, USA)

15P-H1. Application of the Imbalance Difference Method to the EMC Design of Automotive ECUs

L. Niu, T. H. Hubing (Clemson University, USA)

15P-H2. Estimation of Radiated Emissions of an Automotive HV-Inverter in a Distributed System

D. Schneider, M. Boettcher, S. Tenbohlen, W. Koehler (University of Stuttgart, Germany)

15P-H3. S-parameter Estimation for the Components in Automotive High-voltage Units with Partial Measurements

N. Maeda¹, S. Fukui¹, T. Murakami², T. Naito², T. Sekine³, Y. Takahashi³ (¹Nippon Soken, Inc., Japan, ²Toyota Motor Corporation, Japan, ³Gifu University, Japan)

15P-H4. On the Radiation from Common Mode Currents on Cables Placed over Joined Conducting Planes Commonly Used in Vehicles

J. Carlsson, U. Carlberg (SP Technical Research Institute of Sweden, Sweden)

15P-H5. High Quality Factor of CNT-Based Spiral Inductors

F. Maradei¹, M. D'Amore¹, S. Cruciani², M. Feliziani² (¹Sapienza University, Italy, ²L'Aquila University, Italy)

15P-H6. RF Coupling between High-Voltage and Low-Voltage Systems on a System and Component Level

J. Hohloch, S. Tenbohlen, W. Köhler (University of Stuttgart, Germany)

15P-H7. EMC Aspects in Test Benches for Automotive Equipments

M. Pieralisi¹, V. Mariani Primiani¹, P. Russo¹, A. De Leo¹, G. Cerri¹, M. Fioravanti² (¹Università Politecnica delle Marche, Italy, ²Loccioni Group, Italy)

15P-H8W. Full Wave MoM Simulations of High-frequency EM Interactions in EMC Filters

A. Gheonjian¹, B. Khvitia¹, D. Eremyan¹, Z. Kut Chadze¹, R. Jobava¹, X. Bunlon² (¹EMCoS Ltd., Georgia, ²Renault, Technocentre, France)

Room A May 15, Thursday 09:30-10:50

[15A1-A] EMC Measurements (1)

Chairperson: Seungwoo Lee (Chungbuk National University, Korea)

15A1-A1. Measurement Method of Near Electric Field from LED Bulb and Power Line

T. Kasuga¹, Y. Saito¹, T. Ohashi¹, S. Yamada¹, H. Inoue² (¹Nagano National College of Technology, Japan, ²The Open University, Japan)

15A1-A2. The Influence of the Scattering Probe on the Measurement Results of Electromagnetic Fields by the Monostatic Modulated Scatterer Technique

R. A. Vogt-Ardatjew¹, A. E. Sowa² (¹University of Twente, The Netherlands, ²Wroclaw University of Technology, Poland)

15A1-A3. Test Setup for Radio Emission from a Load-wire Connecting LEDs

W. A. Arriola, I. S. Kim (Kyung Hee University, Korea)

15A1-A4. A Fundamental Study on Estimation Method of 10 m Test-range Electric Field Strength by Near-field Measurement

M. Midori¹, H. Kurihara¹, T. Aoyagi² (¹TDK Corporation, Japan, ²Tokyo Institute of Technology, Japan)

Room A May 15, Thursday 11:10-12:30

[15A2-A] EMC Measurements (2)

Chairperson: Jens Medler (Rohde & Schwarz GmbH & Co. KG, Germany)

15A2-A1. A Stable and Low-Cost Site Source for Conducted- and Radiated-Emission Consistency Confirming and Daily Checking of Test Sites

C. H. Lee¹, T. Y. Yang¹, H. C. Hsieh², J. S. Chen², C. N. Chiu³ (¹Electronics Testing Center, Taiwan, ²Bureau of Standards, Metrology and Inspection (BSMI), Taiwan, ³Da-Yeh University, Taiwan)

15A2-A2. Deviations of Conducted Disturbance Voltages Measured with AMN Due to Differences in Height of the AMN and Its Grounding Conditions

Y. Akiyama¹, K. Kakuda², T. Shimasaki³ (¹NTT Energy and Environment Systems Laboratories, Japan, ²NTT Advanced Technology Corp., Japan, ³VCCI Council, Japan)

15A2-A3. The Electric Field Response of the Van Veen Loop

J. S. McLean, K. Takizawa, A. Medina, R. Sutton (TDK R&D Corp., USA)

Room A May 15, Thursday 14:00-15:20

[15P1-A] EMC Measurements (3)

Chairperson: Yoshiharu Akiyama (Nippon Telegraph and Telephone Corp., Japan)

15P1-A1. The Advantages of Spatial Domain Probe Compensation Technique in EMC Near-Field Measurements



M. Schmidt, M. Albach (Friedrich-Alexander-University Erlangen-Nuremberg, Germany)

15P1-A2. Automated EMC/EMI Near-Field Testbed

S. Kuehn¹, N. Kuster¹, M. Wild², E. Grobelaar², P. Sepan², B. Kochali², A. Fuchs², J. Lienemann² (¹IT'IS Foundation / ETH Zurich, Switzerland, ²Schmid & Partner Engineering AG, Switzerland)

15P1-A3. Study on the Measurement of Microscopic RF Field Distribution with a MFM Tip Exploiting a Beat Signal Between a CPW and an Exciting Coil

Y. Endo, M. Onishi, M. Fukushima, K. Arai, K. Yanagi, Y. Shimada, M. Yamaguchi (Tohoku University, Japan)

15P1-A4. Measurement of Complex Near Magnetic Fields by Using 6-port Network



M. Kawakami¹, T. Nambu¹, K. Murano², Y. Kami¹, F. Xiao¹ (¹University of Electro-Communications, Japan, ²Tokai University, Japan)

Room A May 15, Thursday 15:40-17:20

[15P2-A] Biological Effects, EMF Safety & EMC in Medical Applications and Safety (3)

Chairperson: Benoit Derat (ART-Fi SAS, France)

15P2-A1. Design a Dual-Band High-Impedance Surface Structure for Electromagnetic Protection in WLAN Applications

M. S. Lin¹, Y. H. Huang², C.-I. G. Hsu³ (¹National Yunlin University of Science & Technology (NYUST), Taiwan)

15P2-A2. Measurement of Electromagnetic Field in the Vicinity of Wireless Power Transfer System for Evaluation of Human-Body Exposure

T. Iwamoto^{1,2}, T. Arima¹, T. Uno¹, K. Wake², K. Fujii², S. Watanabe² (¹Tokyo University of Agriculture and Technology, Japan, ²National Institute of Information and Communications Technology, Japan)

15P2-A3. A Dispersion Modeling Approach for Designing Broadband Tissue-Simulating Fluids

K. Quéléver^{1,2}, B. Derat¹, O. Meyer³, T. Coradin², C. Bonhomme² (¹ART-FI SAS, France, ²Sorbonne Universités, UPMC Univ Paris 06, CNRS, UMR 7574, Laboratoire de Chimie de la Matière Condensée de Paris, Collège de France, Paris, France, ³Laboratoire de Génie Electrique de Paris Sorbonne Universités, UPMC Univ Paris 06, Supélec, Univ Paris Sud 11, CNRS UMR 8507, LGEP Gif-sur-Yvette, France)

15P2-A4. Dielectric Property Measurement of Skin and Dosimetry for Millimeter Wave Irradiation up to 100 GHz



K. Sasaki, T. Nagaoka, K. Wake, S. Watanabe (National Institute of Information and Communications Technology, Japan)

15P2-A5. Complex Permittivity Measurement Method of High Loss Materials Using Cylindrical Cavity Resonator in Millimeter-wave Band

A. Tameishi¹, T. Kamijo¹, Y. Suzuki¹, A. Kik¹, K. Sasaki², M. Taki¹ (¹Tokyo Metropolitan University, Japan, ²National Institute of Information and Communications Technology, Japan)

Room B May 15, Thursday 09:30-10:50

[15A1-B] Chip, Package, PCB & Cables (4)

Chairperson: Kengo Iokibe (Okayama University, Japan)

15A1-B1. Guard Trace with Periodic Structure for Reducing Common-mode Radiation and Maintaining Signal Integrity

Y. Terai¹, Y. Toyota¹, K. Iokibe¹, T. Watanabe² (¹Okayama University, Japan, ²Industrial Technology Center of Okayama Prefecture, Japan)

15A1-B2. Analysis of Radiated Emission Performance of Various Passive Signal Integrity Improvement Techniques

Y. Ji, K. Mouthaan, N. Venkatarayalu (National University of Singapore, Singapore)

15A1-B3. Estimation of Common Mode Current on Coaxial Cable with Twisted Wire Pair

T. Takahashi¹, L. Niu², T. Hubing² (¹Takushoku University, Japan, ²Clemson University, USA)

15A1-B4. Evaluation of Practical Model of an On-board Type Common Mode Choke Coil for 3D EMC Simulation

F. Nakamoto, Y. Sasaki, Y. Watanabe, C. Miyazaki, N. Oka (Mitsubishi Electric Corp., Japan)

Room B May 15, Thursday 11:10-12:30

[15A2-B] Chip, Package, PCB & Cables (5)

Chairperson: Takehiro Takahashi (Takushoku University, Japan)

15A2-B1. Power and Ground Phase Relation in LSI Power Distribution

Network at Common-mode Noise Reduction

T. Murakami¹, M. Maeda¹, Y. Mabuchi², T. Matsushima¹, T. Hisakado¹, O. Wada¹ (¹Kyoto University, Japan, ²Hitachi, Ltd., Japan)

15A2-B2. Parasitic Inductive Coupling of Integrated Circuits with their Environment

D. Ioan¹, G. Ciuprina¹, W. Schilders² (¹Polytechnic University of Bucharest, Romania, ²T. U. Eindhoven, The Netherlands)

15A2-B3. High Spatial Resolution On-chip Active Magnetic Field Probe for IC Chip-Level Near Field Measurements

Y. Shigeta¹, N. Sato¹, K. Arai¹, M. Yamaguchi¹, S. Kageyama² (¹Tohoku University, Japan, ²Toppa Technical Design Center Corp., Japan)

15A2-B4. Investigation on Realizing 1 Ω Current Probe Complied with IEC 61967-4 Direct Coupling Method



Y.-C. Chang^{1, 2}, P.-Y. Wang², S. S. H. Hsu², Y.-T. Chang³, C.-K. Chen³, H.-C. Cheng¹, D.-C. Chang¹ (¹National Applied Research Laboratories, Taiwan, ²National Tsing Hua University, Taiwan, ³Bureau of Standards, Metrology & Inspection, M.O.E.A., Taiwan)

Room B May 15, Thursday 14:00-17:00

[Organized Session/Workshop: 15P-B] EMC Topics Related to Smart Grid

Organizer: Masamitsu Tokuda (The University of Tokyo, Japan)

Chairperson: Yasutoshi Yoshioka (Fuji Electric, Japan)

Co-Chairperson: Gerhard F. Bartak (Consultant, Austria)

15P-B1. EMI in the Frequency Range 2 - 150 kHz

G. F. Bartak¹, A. Abart² (¹Consultant, Austria, ²Netz OÖ GmbH, Austria)

15P-B2. Electromagnetic Interference Examples of Telecommunications System in the Frequency Range from 2kHz to 150kHz

K. Murakawa, H. Hirasawa, H. Ito, Y. Ogura (NTT EAST, Japan)

15P-B3. CISPR Limits for the Conducted Disturbances of DC Ports of PV-GCPCs

Y. Yoshioka (Fuji Electric Co., Ltd., Japan)

15P-B4. EMC Issues around Traction Power Supply System

H. Hayashiya (East Japan Railway Company, Japan)

15P-B5. Lightning Strike Fault Risk on Wind Power Generation System

T. Shindo (Central Research Institute of Electric Power Industry, Japan)

15P-B6. Geomagnetic Storm Impacts on the High-Voltage Power Grid: Current Understanding and Mitigation Concepts

W. Radasky (Metatech Corporation, USA)

15P-B7. EMC Issues on Wireless Power Transfer

S. Obayashi¹, H. Tsukahara² (¹Toshiba Corp., Japan, ²Nissan Motor Co., Ltd., Japan)

15P-B8W. EMC Standards for Charging System of Electric Vehicle

H. Tsukahara (Nissan Motor Co., Ltd., Japan)

Room S May 15, Thursday 09:30-12:30

[Workshop: 15A-S] Recent Trend of EMC on Smart Grid

Organizer: Masamitsu Tokuda (The University of Tokyo, Japan)
Chairperson: Masamitsu Tokuda (The University of Tokyo, Japan)
Co-Chairperson: William A. Radasky (Metatech Corp., USA)

15A-S1W. Recent Trend of EMC on Smart Grid in the USA

W. Radasky (Metatech Corporation, USA)

15A-S2W. Recent EMC Standardization Activity Related to Smart Grid in EU

H. Rochereau (EDF, France)

15A-S3W. Recent Trend of EMC on Smart Grid in Japan

M. Tokuda (The University of Tokyo, Japan)

15A-S4W. Recent Trend of EMC on Smart Grid in Korea

H. Ahn (KESRI (Korea Electrical Engineering & Science Research Institute), Korea)

15A-S5W. Recent Trend of EMC on Smart Grid in China

J. Zheng (STIEE: Shanghai Testing & Inspection Institute for Electrical Equipment, China)

15A-S6W. Recent Trend of EMC on Smart Grid in IEC

H. Ohsaki (The University of Tokyo, Japan)

Room S May 15, Thursday 14:00-15:20

[Organized Session: 15P1-S] Electromagnetic Noise Radiation and EMI Effects Caused by ESD

Organizers: Shigeki Minegishi (Tohoku Gakuin University, Japan) and Ken Kawamata (Tohoku Gakuin University, Japan)
Chairperson: Takayoshi Ohtsu (Suzuka National College of Tech., Japan)
Co-Chairperson: Dan Shi (Beijing University of Posts and Telecommunication, China)

15P1-S1. Frequency Analysis of Transient Electromagnetic Wave Caused by Low Voltage ESD in Spherical Electrode

K. Kawamata¹, S. Minegishi¹, O. Fujiwara² (¹Tohoku Gakuin University, Japan, ²Nagoya Institute of Technology, Japan)

15P1-S2. ESD Study on Discharge Current and Radiated Electromagnetic Wave with Conductive Polycarbonate Composite Resin

T. Ohtsu¹, H. Doyama¹, K. Sagisaka², T. Shirayama² (¹Suzuka National College of Technology, Japan, ²Yukadenshi Co.,Ltd., Japan)

15P1-S3. Characteristics of Small Gap Discharge Event and their EMI Effects

M. Honda¹, S. Isofuku² (¹Impulse Physics Laboratory, Inc., Japan, ²Tokyo Electronics Trading Co., Ltd., Japan)

15P1-S4. The Distinction among Electromagnetic Radiation Source Models Based on Directivity with Support Vector Machines

Z. Liu¹, D. Shi¹, Y. G. Gao¹, Y. Q. Shen², J. J. Bi³, Z. L. Tan³ (¹Beijing University, China, ²Telecommun. Metrol.Center, China, ³Key Lab. of Electromagn. Environ. Effect, Shijiazhuang Mech. Eng., China)

Room H May 16, Friday 09:30-10:30

[16A1-H] Biological Effects, EMF Safety & EMC in Medical Applications and Safety (4)

Chairperson: Yoon Myoung Gimm (Dankook University / EMF Safety Inc., Korea)

16A1-H1. Evaluation of Magnetic Field Generated by Power Facilities in Accordance with IEC 62110

Y. Miyaji¹, M. Shimada¹, Y. Mizuno¹, K. Naito² (¹Nagoya Institute of Technology, Japan, ²N. S. Co., Ltd., Japan)

16A1-H2. Impact of Malaysian EMF Standard on Electrical Line Design and Performance

B. H. K. Chia (Sarawak Energy Berhad, Malaysia)

16A1-H3. An Estimation Method for Vector Probes Used in Determination SAR of Multiple-Antenna Transmission Systems

D. T. Le¹, L. Hamada¹, S. Watanabe¹, T. Onishi² (¹National Institute of Information and Communications Technology (NICT), Japan, ²NTT DOCOMO, INC., Japan)

Room H May 16, Friday 10:50-12:30

[Organized Session: 16A2/P1-H] Recent Trends of Standardization Activities and Evaluation Techniques for the Electromagnetic Exposure to the Human Body

Organizers: Lira Hamada (National Institute of Information and Communications Technology, Japan)

Chairperson: Lira Hamada (National Institute of Information and Communications Technology, Japan)

Co-Chairperson: Sven Kuhn (IT'IS foundation, Switzerland)

16A2-H1. Research in ITU-T SG5 about Method for Evaluating of Human Exposure Levels when Installing a New Wireless Installation

B. C. Kim, H. Choi (ETRI, Korea)

16A2-H2. Low-EMF Future Networks: the LEXNET EU Project

J. Wiart¹, E. Conil¹, N. Varsier¹, T. Sarrebourg¹, A. Hadjem¹, L. Martens², G. Wermereen², Y. Yoann Corre³ (¹Orange Labs / WHIST lab¹, France, ²Iminds / Ghent University, Belgium, ³SIRADEL, France)

16A2-H3. EMF Regulation Changes and Some Related Studies of Human Exposure to Electromagnetic Fields in S. Korea

D. G. Choi¹, K. H. Kim¹, S. Y. Chung¹, Y. M. Gimm² (¹National Radio Research Agency, Korea, ²Dankook University, Korea)

16A2-H4. Simulated Near-Field Gain and E-Field Intensity of Insulated Loop Antenna in the Liquid at 30 MHz

N. Ishii^{1,2}, R. Takezawa¹, L. Hamada², S. Watanabe² (¹Niigata University, Japan, ²National Institute of Information and Communications Technology, Japan)

16A2-H5. An Ultra Wideband Alternative to Dipoles for SAR System Verification

B. Derat¹, A. Lages¹, L. Aberbour¹, T. Julien¹, D. Manteuffel² (¹ART-Fi, France, ²CAU Kiel, Germany)

Room H May 16, Friday 14:00-14:40

[Organized Session: 16A2/P1-H] Recent Trends of Standardization Activities and Evaluation Techniques for the Electromagnetic Exposure to the Human Body

Organizer: Lira Hamada (National Institute of Information and Communications Technology, Japan)

Chairperson: Lira Hamada (National Institute of Information and Communications Technology, Japan)

Co-Chairperson: Sven Kuhn (IT'IS foundation, Switzerland)

16P1-H1. Design of Electric Field Meter to Assess Human Exposure in Environment with Mobile Base Station

J. Higashiyama, Y. Tarusawa (NTT DOCOMO, INC., Japan)

16P1-H2. Novel Fast SAR Methods for Compliance Testing of Wireless Devices

N. Kuster, M. G. Douglas (IT'IS Foundation / ETH Zurich Switzerland, Switzerland)

Room H May 16, Friday 14:40-16:20

[Workshop: 16P2-H] Photonics-applied Electromagnetic Measurement for EMC

Organizer: Teruo Onishi (NTT DOCOMO, INC., Japan)

Chairperson: Qiang Chen (Tohoku University, Japan)

16P2-H1W. Activities of PEM Research and Development in Japan

S. Kurokawa (National Institute of Advanced Industrial Science and Technology (AIST), Japan)

16P2-H2W. Lecture of EO Effect and Its Sensors

H. Murata (Osaka University, Japan)

16P2-H3W. Product Trends of Optical E-field Sensor

J. Ichijoh (SEIKOH GIKEN Co.,Ltd., Japan)

16P2-H4W. Antenna Pattern Measurements Using Photonic Sensor

M. Hirose (National Institute of Advanced Industrial Science and Technologies (AIST), Japan)

16P2-H5W. Photonic Technologies Applied to Evaluation of the Human Exposure to Electromagnetic Fields

T. Onishi (NTT DOCOMO INC., Japan)

Room H May 16, Friday 16:40-18:20

[Organized Session: 16P3-H] Photonics-applied Electromagnetic Measurement for EMC

Organizer: Teruo Onishi (NTT DOCOMO, INC., Japan)

Chairperson: Hiroyoshi Togo (NTT Microsystem Integration)

16P3-H1. Development of Optical Electric Field Sensors for EMC Measurement

B. G. Loader¹, M. J. Alexander¹, R. Osawa² (¹National Physical Laboratory, United Kingdom, ²Seikoh-Giken, Japan)

16P3-H2. Metal-free Electric-field Probe based on Photonics and its EMC Applications

H. Togo (NTT Microsystem Integration Laboratories, Japan)

16P3-H3. Active Electro-Optical Probe System for B1-Field Polarization Mapping in Magnetic Resonance Imaging Systems

S. N. Kuehn¹, B. Kochali², N. Kuster¹ (¹IT'IS Foundation / ETH Zurich, Switzerland, ²Schmid&Partner Engineering AG, Switzerland)

16P3-H4. Antenna Measurement by Simple Optical Link System Using Radio on Fiber Technologies

S. Kurokawa¹, M. Hirose¹, M. Ameya¹, Y. Toba² (¹National Institute of Advanced Industrial Science and Technology, Japan, ²SEIKOH GIKEN Co.,Ltd., Japan)

16P3-H5. Shielding Effectiveness Evaluation of Enclosure with Apertures Using Electro-Optic Sensor

N.-W. Kang¹, D.-J. Lee¹, W. Kang², Y.-S. Chung² (¹Korea Research Institute of Standards and Science, Korea, ²Kwangwoon University, Korea)

Room A May 16, Friday 09:30-10:50

[16A1-A] EMC Measurements (4)

Chairperson: Toshihide Tosaka (National Institute of Information and Communications Technology, Japan)

16A1-A1. Apertures Coupling for Electrical Field Calculation in Ariane 5 Launcher Cavities Experimental Characterization of Apertures' Effective Coupling Cross Section in Oversized Complex Cavities
A. Bertrand, M. Ramos (Airbus Defence and Space, France)

16A1-A2. Analysis of Large E Field Generators in Semi-Anechoic Chambers Used for Full Vehicle Immunity Testing: Numerical and Measured Results
V. Rodriguez (ETS-Lindgren Inc., USA)

16A1-A3. Influence of Reverberation Chamber Loading on Extreme Field Strength
R. A. Vogt-Ardatjew¹, S. G. van de Beek¹, F. B. J. Leferink^{1,2} (¹University of Twente, The Netherlands, ²Thales Nederland B.V., The Netherlands)

Room A May 16, Friday 11:10-12:30

[16A2-A] Communication System EMC (1)

Chairperson: Ifong Wu (National Institute of Information and Communications Technology, Japan)

Co-Chairperson: Yasushi Matsumoto (National Institute of Information and Communications Technology, Japan)

16A2-A1. Representation and Analysis of Radio Receivers' Susceptibility and Nonlinearity by the Use of 3D Double-Frequency Characteristics
E. Sinkevich, V. Mordachev, D. Petrachkov (Belarusian State University of Informatics and Radioelectronics, Belarus)

16A2-A2. Measurement of Radio Receivers' Front-End Nonlinearity by the Frequency Slipping Technique
E. Sinkevich, V. Mordachev (Belarusian State University of Informatics and Radioelectronics, Belarus)

16A2-A3. A Novel LTE MIMO Antenna with Decoupling Element for Mobile Phone Application
J. Chou¹, D. Lin², C. Wu², H. Li¹ (¹National Taiwan University, Taiwan, ²National Taipei University of Technology, Taiwan)

Room A May 16, Friday 14:00-15:20

[16P1-A] Communication System EMC (2)

Chairperson: Yasushi Matsumoto (National Institute of Information and Communications Technology, Japan)

Co-Chairperson: Ifong Wu (National Institute of Information and Communications Technology, Japan)

16P1-A1. Characteristics of Propagation Conditions in the Container Terminal Environment

S. J. Ambroziak, R. J. Katulski (Gdansk University of Technology, Poland)

16P1-A2. Technical Requirements for Portable TVWS Devices

I. Gepko (Ukrainian State Centre of Radio Frequencies, Ukraine)

16P1-A3. Concept of Compatibility Region for the Evaluation of IR UWB Electromagnetic Compatibility

R. J. Katulski, J. Sadowski (Gdansk University of Technology, Poland)

16P1-A4. An Evaluation of Noise Power Using the Weighted Magnetic Field Product for Intra-EMC Problems

T. Maekawa¹, K. Ogawa² (¹Panasonic Corp., Japan, ²Toyama University, Japan)

Room A May 16, Friday 15:40-18:20

[Tutorial: 16P2-A] Recent Topics of EMC Standardization - Role of ACEC -

Organizer: Noboru Schibuya (Takushoku University, Japan)

Chairperson: Donald N. Heirman (Don HEIRMAN Consultants, USA)

Co-Chairperson: Noboru Schibuya (Takushoku University, Japan)

16P2-A1T. What is ACEC?

W. Radasky (Metatech Corporation, USA)

16P2-A2T. IEC International Special Committee on Radio Interference (CISPR) Report

D. Heirman (Don HEIRMAN Consultants, USA)

16P2-A3T. Recent Trend of TC 77 and its Subcommittees

H. Ohsaki (The University of Tokyo, Japan)

16P2-A4T. Recent Topics in EMC: Emission Standardization in 2-150 kHz Frequency Band

H. Rochereau (EDF, France)

16P2-A5T. Recent Topics in EMC: E-mobility

J. Delaballe (Consultant for Schneider Electric, France)

16P2-A6T. Recent Topics in EMC: Medical Electronics

R. Sitzmann (Siemens AG, Germany)

16P2-A7T. Recent Topics in EMC: Human Exposure to RF

D. Heirman (Don HEIRMAN Consultants, USA)

Room B May 16, Friday 09:30-10:50

[16A1-B] Immunity / Susceptibility, ESD and Transients (1)

Chairperson: Jianqing Wang (Nagoya Institute of Technology, Japan)
Co-Chairperson: Kimitoshi Murano (Tokai University, Japan)

16A1-B1. Improved Surge Protection of Flip-Chip Gallium Nitride-based HEMTs by Metal-Semiconductor-Metal Two-Dimensional Electron Gas Varactor

L. B. Chang¹, C. Shih¹, T. Huang¹, C. Tien², P. Kuei² (¹Chang Gung University, Taiwan, ²National Defense University, Taiwan)

16A1-B2. Improvement of ESD Robustness in Gallium Nitride-based Flip-Chip HEMT by Introducing Metal-Insulator-Metal Capacitor

P. Kuei¹, N. Cheng², Y. Ferng³, A. Das³, S. Lin³, C. Lin³, L. Chang³, Y. Chen² (¹National Defense University, Taiwan, ²National Central University, Taiwan, ³Chang Gung University, Taiwan)

16A1-B3. A Case Study on ESD Immunity Test for a Small-Type Control Board



C. Ji¹, D. Anzai¹, J. Wang¹, I. Mori², O. Fujiwara¹ (¹Nagoya Institute of Technology, Japan, ²Suzuka National College of Technology, Japan)

16A1-B4. Assessing the Effect of Discharge Gap Shape on High-Speed Electrostatic Discharge Events

M. Masugi¹, Y. Okugawa², Y. Akiyama², N. Hirasawa³, K. Murakawa³ (¹Ritsumeikan University, Japan, ²NTT corp., Japan, ³NTT east corp., Japan)

Room B May 16, Friday 11:10-12:30

[16A2-B] Immunity / Susceptibility, ESD and Transients (2)

Chairperson: Kimitoshi Murano (Tokai University, Japan)
Co-Chairperson: Jianqing Wang (Nagoya Institute of Technology, Japan)

16A2-B1. Measurement of Spark Length for Air Discharges of Electrostatic Discharge Generators

Y. Taka¹, O. Fujiwara² (¹Kushiro National College of Technology, Japan, ²Nagoya Institute of Technology, Japan)

16A2-B2. A Measurement on Electromagnetic Noises from ESD Generator just Before and After ESD Testing



T. Ishida¹, Y. Tozawa¹, M. Takahashi¹, O. Fujiwara², S. Nitta² (¹Noise Laboratory Co.,LTD., Japan, ²University of Electro-Communications, Japan)

16A2-B3. Statistical Measurement of Burst Discharge Currents through Fingertip from Charged Human

Y. Kagawa¹, I. Mori², Y. Taka³, O. Fujiwara¹ (¹Nagoya Institute of Technology, Japan, ²Suzuka National College of Technology, Japan, ³Kushiro National College of Technology, Japan)

16A2-B4. EMI Evaluation Based on Electromagnetic and Circuit Analysis for Human Body Communication Systems

D. Anzai, J. Wang (Nagoya Institute of Technology, Japan)

Room B May 16, Friday 14:00-16:00

[16P1-B] Shielding, Grounding & Materials (1)

Chairperson: Kenichi Hatakeyama (University of Hyogo, Japan)
Co-Chairperson: Atsuhiko Nishikata (Tokyo Institute of Technology, Japan)

16P1-B1. A Study on Measurement Method of Shielding Effectiveness using Loop Antenna in Low-frequency

M. Ishii, Y. Yamazaki (National Institute of Advanced Industrial Science and Technology, Japan)

16P1-B2. Study on Grounding Condition of Shield Sheath in Shielded Twisted Pair Cable

Y. Watanabe, T. Uchida, Y. Sasaki, N. Oka, H. Ohashi (Mitsubishi Electric Corporation, Japan)

16P1-B3. Electromagnetic Field Distribution in Areas surrounded by Many Wires

H. Echigo, K. Aizawa (Tohoku Gakuin University, Japan)

16P1-B4. Reflection and Transmission of Laminated Structures Consisting a Wire Grid and a Dipole Array Sheet and Dielectric Layer

S. Yamamoto¹, K. Suezaki¹, K. Hatakeyama¹, T. Tsutaoka² (¹University of Hyogo, Japan, ²Hiroshima University, Japan)

16P1-B5. Optimized Shielding Pattern of RF Faraday Cage

N. Ohmura¹, Y. Okano², S. Ogino¹ (¹Microwaveabsorbers Inc., Japan, ²Tokyo City University, Japan)

16P1-B6. EM-Wave Absorber Composed of Periodic Patch Antennas Designed for Both H- and V-polarized Waves at 2.4GHz Band

H. Okawa, A. Nishikata (Tokyo Institute of Technology, Japan)

Room B May 16, Friday 16:20-18:20

[16P2-B] Shielding, Grounding & Materials (2)

Chairperson: Atsuhiko Nishikata (Tokyo Institute of Technology, Japan)
Co-Chairperson: Kenichi Hatakeyama (University of Hyogo, Japan)

16P2-B1. Effect of Height and Width of Pyramid on Temperature Distribution Characteristics of Pyramidal Radiowave Absorbers

S. Imai¹, K. Taguchi¹, T. Kashiwa¹, T. Tabata², K. Kubo², E. Satou² (¹Kitami Institute of Technology, Japan, ²E&C Engineering Co., Ltd., Japan)

16P2-B2. Printed Circuit Board Permittivity Measurement Using Waveguide and Resonator Rings

S. T. Op 't Land¹, O. V. Tereshchenko², M. Ramdani¹, F. B. J. Leferink², R. Perdriau¹ (¹Groupe ESEO, France, ²University of Twente, The Netherlands)

16P2-B3. Analysis of the Permeability Spectra of Fe-Al-Si Granular Composite Materials

T. Tsutaoka¹, H. Kinoshita¹, T. Kasagi², S. Yamamoto³, K. Hatakeyama³, M. Y. Koledintseva⁴ (¹Hiroshima University, Japan, ²Tokuyama College of Technology, Japan, ³University of Hyogo, Japan, ⁴Missouri University of Science & Technology, USA)

16P2-B4. Effect of Demagnetizing Field on Frequency Dispersion of Complex Permeability

S. Muroga, M. Yamaguchi (Tohoku University, Japan)

16P2-B5. Multilayer Ground Determination from Apparent Resistivities and Impact on Grounding Resistances



G. P. Papaiz-Garbin^{1, 2}, L. Pichon², M. Cucchiaro¹, N. Haddad¹ (¹SNCF Engineering, Electromagnetic Compatibility Service, France, ²LGEP, France)

Room S May 16, Friday 09:30-11:50

[Organized Session: 16A1-S] Computational Techniques, Modeling, and Simulation for Electromagnetics

Organizers: Shinichiro Ohnuki (Nihon University, Japan) and Yoshiaki Ando (The University of Electro-Communications, Japan)

Chairperson: Shinichiro Ohnuki (Nihon University, Japan)

Co-Chairperson: Yoshiaki Ando (The University of Electro-Communications, Japan)

16A1-S1. Numerical Calculation of Electromagnetic Scattering from Multiple Objects by Superposition Solution Combined with MoM — Multilevel Algorithm —

M. Tanaka (Gifu University, Japan)

16A1-S2. Scattering Analysis of the Microstrip Array Antenna by Using the PMCHWT-CBFM

T. Tanaka, Y. Nishioka, Y. Inasawa, H. Miyashita (Mitsubishi Electric Corp., Japan)

16A1-S3. A Subgridding Technique for the CIP Method

Y. Ando¹, T. Hirota² (¹The University of Electro-Communications, Japan, ²Simulatio Co. Ltd., Japan)

16A1-S4. Estimation of Induced EMF Value in Ground Wire During Ice-Melting Procedure

K. Neteba¹, N. Korovkin¹, S. Vinogradov¹, V. Goncharov¹, M. Hayakawa^{2,3}, A. Repin⁴, A. Shershnev⁴, N. Silin⁵ (¹St. Petersburg State Polytechnic University, Russia, ²The University of Electro-Communications, Japan, ³Advanced Wireless Communications Research Center and Research Station on Seismo Electromagnetics, Japan, ⁴Joint-Stock Company High Voltage Direct Current Power Transmission Research Institute, Russia, ⁵Far Eastern Federal University, Russia)

16A1-S5. Pulse Responses in the Dispersion Media

R. Ozaki, T. Yanaka, N. Sugizaki, T. Yamasaki (Nihon University, Japan)

16A1-S6. Efficient Reflection/transmission Coefficient by Two-layered Dielectric Slab for Accurate Propagation Analysis

R. Sato¹, H. Shirai² (¹Niigata University, Japan, ²Chuo University, Japan)

Room S May 16, Friday 11:50-12:30

[16A2-S] Numerical Modeling (4)

Chairperson: Sergio A. Pignari (Politecnico di Milano, Italy)

16A2-S1. Comparison of Steady-State Genetic Algorithm and Asynchronous Particle Swarm Optimization on Inverse Scattering of a Partially Immersed Metallic Cylinder

C. H. Sun¹, C. H. Chen², C. H. Huang², C. L. Li³, E. N. Chiu³, S. L. Lee¹ (¹National Taiwan University of Science and Technology, Taiwan, ²Taipei College of Maritime Technology, Taiwan, ³Tamkang University, Taiwan)

16A2-S2. Inverse Scattering Problem of a Two-Dimensional Dielectric Cylinder in Slab Medium

C. H. Chen¹, C. H. Huang¹, C. H. Sun², C. L. Li³, P. R. Lai³, G. C. Wang¹ (¹Taipei College of Maritime Technology, Taiwan, ²National Taiwan University of Science and Technology, Taiwan, ³Tamkang University, Taiwan)

Room S May 16, Friday 14:00-16:00

[Organized Session: 16P1-S] GPU Computing-based Acceleration of Electromagnetic Simulation

Organizers: Kan Okubo (Tokyo Metropolitan University, Japan) and Emeritus Nagayoshi Morita (MWS lab., Japan)

Chairperson: Kan Okubo (Tokyo Metropolitan University, Japan)

Co-Chairperson: Ilari Hänninen (Computer Simulation Technology AG, Germany)

16P1-S1. Acceleration of Various Direct/Iterative Solvers for MoM by GPU and Its Computational Cost

K. Konno¹, Q. Chen¹, H. Katsuda² (¹Tohoku University, Japan, ²NTT Network Innovation Laboratories, Japan)

16P1-S2. High Performance Computing Techniques for Efficient 3D Full-Wave Simulation of EMC Problems

I. Hänninen, F. Wolfheimer, A. Barchanski, D. Kostka (CST AG, Germany)

16P1-S3. GPU Acceleration on Computational Dosimetry for Rabbit Eyes Exposed to Millimeter Waves

Y. Suzuki¹, A. Koike¹, M. Takamura¹, M. Taki¹, M. Kojima², K. Sasaki³, J. Chakarothai³, K. Wake³, S. Watanabe³ (¹Tokyo Metropolitan University, Japan, ²Kanazawa Medical University, Japan, ³National Institute of Information and Communications Technology, Japan)

16P1-S4. GPU Calculation Algorithm for Radiation from MMIC Passive Components

N. Morita (M Wave Solver Lab., Japan)

Room S May 16, Friday 16:20-18:20

[Organized Session: 16P2-S] Aerospace EMC

Organizers: Filippo Marliani (European Space Agency, The Netherlands) and Sergio A. Pignari (Politecnico di Milano, Italy)

Chairperson: Sergio A. Pignari (Politecnico di Milano, Italy)

Co-Chairperson: Johannes Wolf (European Space Agency, The Netherlands)

16P2-S1. Electromagnetic Interference Control Techniques for Spacecraft Harness

A. Junge¹, J. Wolf¹, N. Mora², F. Rachidi², P. Pelissou³ (¹ESA - ESTEC, The Netherlands, ²EPFL, Switzerland, ³Astrium SAS, France)

16P2-S2. EMC Issues on Bepicolombo Spacecraft

K. Kempkens (Astrium GmbH, Germany)

16P2-S3. Comparison of Rotational-Run vs Hybrid-Measurement by Modelling of a Large Test Object/Satellite

H. Kuegler (IABG, Germany)

16P2-S4. Sensitivity to Setup Configuration of the Response of Differential Lines Driven by an External Field

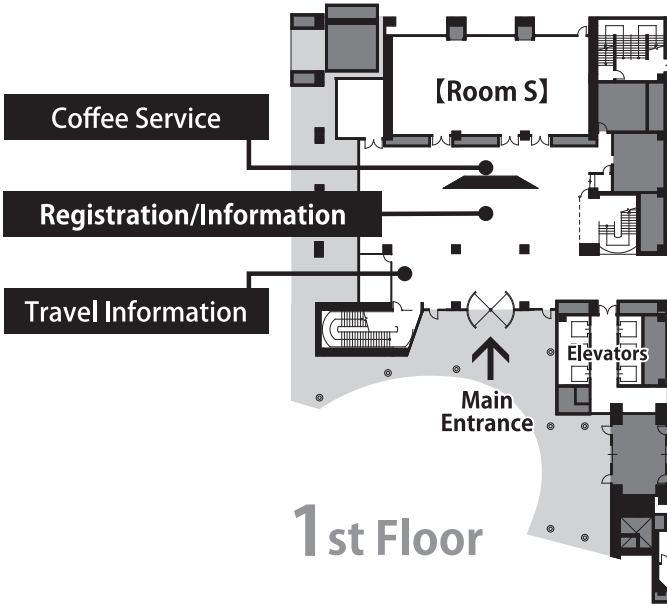
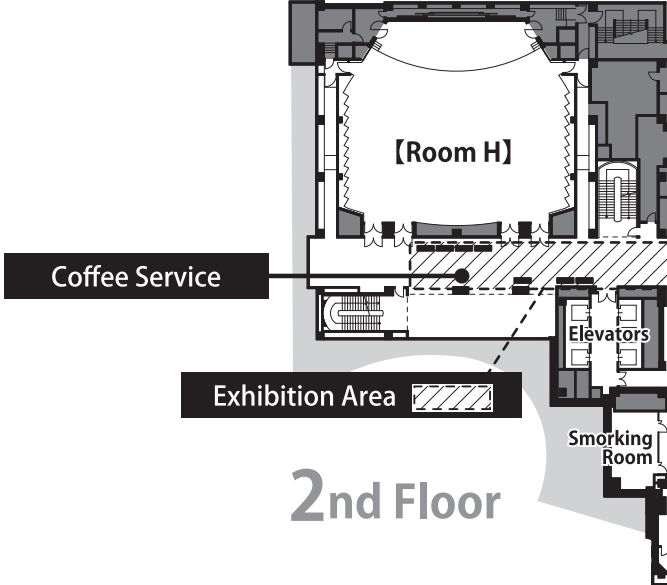
F. Grassi¹, S. A. Pignari¹, G. Spadacini¹, F. Marliani² (¹Politecnico di Milano, Italy, ²European Space Agency (ESA), The Netherlands)

16P2-S5. VHF Switching DC/DC Converter Electromagnetic Emissions Assessment

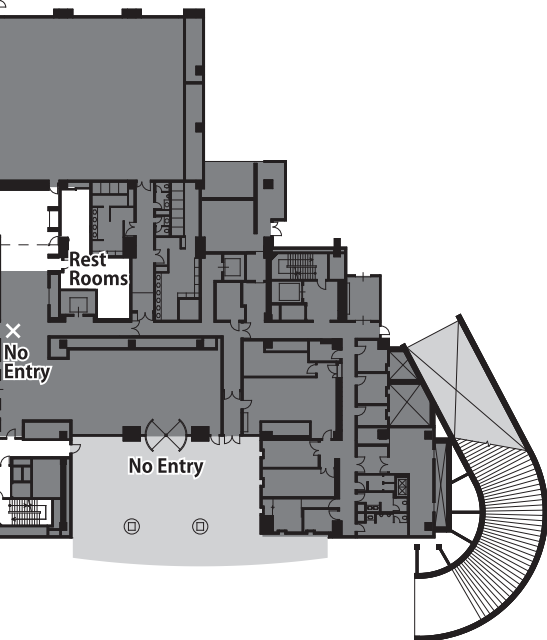
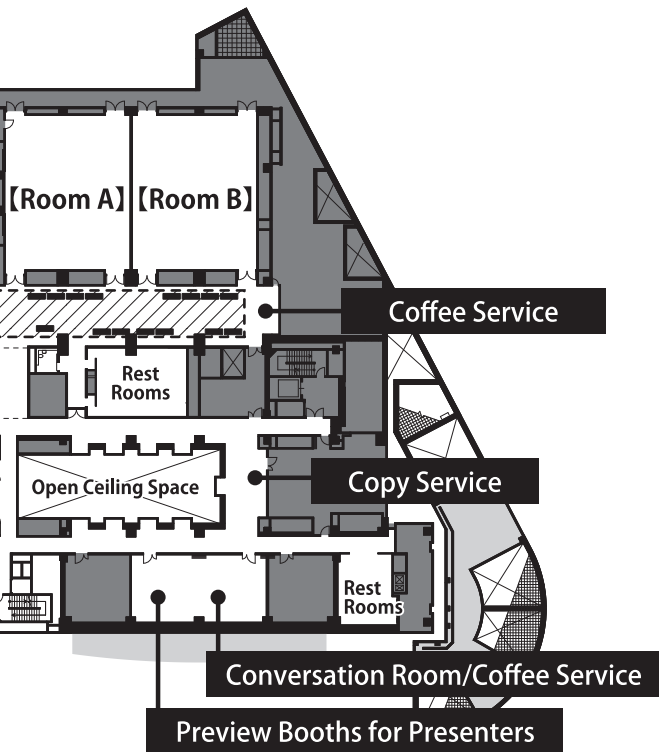
C. Delepaut¹, J. Wolf¹, F. Leroy², O. Deblecker², F. Dualibe², N. Le Gallou¹ (¹European Space Agency, The Netherlands, ²University of Mons, Belgium)

Memo

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* Please use the elevators to go up to the "3rd" floor, where a cafeteria is available.



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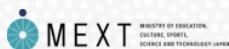
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