

2010 Conference on Precision Electromagnetic Measurements

PROGRAM

June 13-18, 2010
Daejeon, Korea



PROGRAM AT A GLANCE

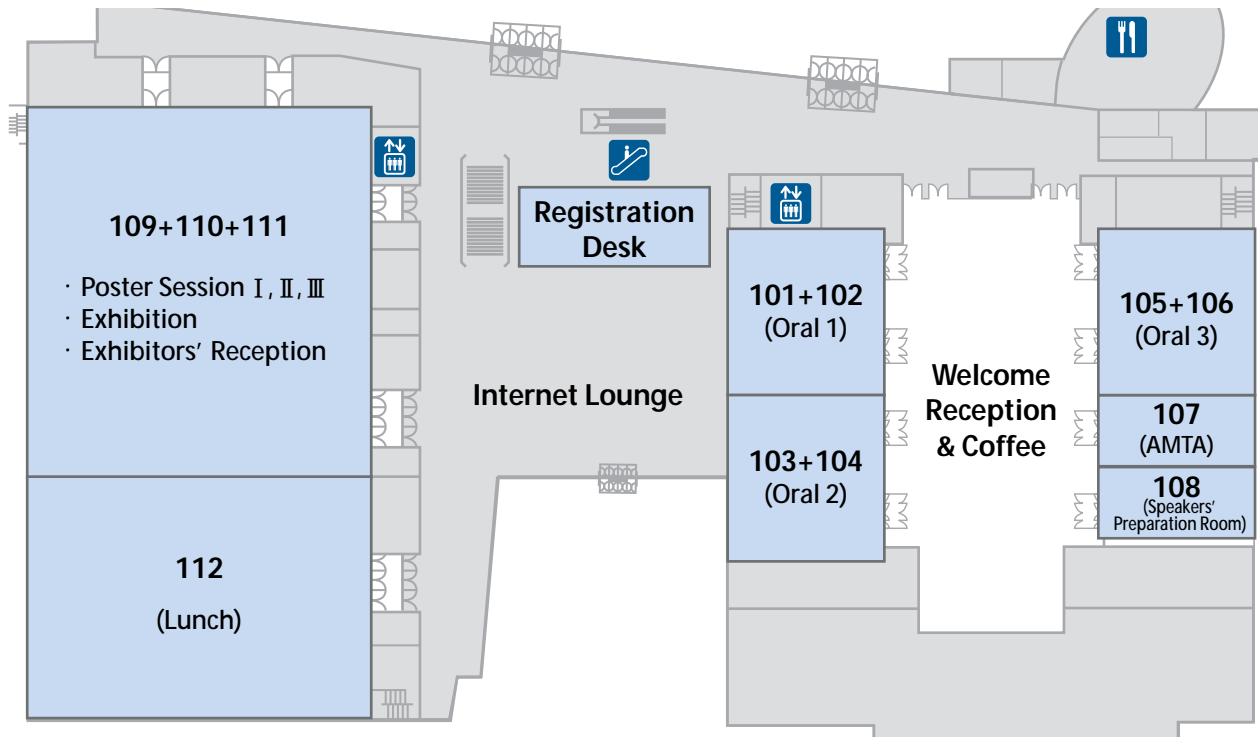
	Sunday, June 13	Monday, June 14			Tuesday, June 15		
		Room (101+102)	Room (103+104)	Room (105+106)	Room (101+102)	Room (103+104)	Room (105+106)
7:30		Speaker's Breakfast					
8:00							
8:30							
9:00		[PS1] Plenary Session 1 • B. Kibble (201)		[PS3] Plenary Session 3 • H. Katori • J. Pekola (201)			
9:30		[PS2] Plenary Session 2 • A. J. Wallard (201)					
10:00							
10:30		Coffee					
11:00		Opening Session (201)			[TuA1] Voltage (DC/AC) IV	[TuB1] Fundamental Constant IV	[TuC1] Time & Frequency IV
11:30		[MoA1] Voltage (DC/AC) I	[MoB1] Fundamental Constant I	[MoC1] Time & Frequency I			
12:00							
12:30		Lunch (112)					
13:00							
13:30							
14:00	Registration	[MoA2] Voltage (DC/AC) II	[MoB2] Fundamental Constant II	[MoC2] Time & Frequency II	[TuA2] Current (DC/AC) I	[TuB2] Fundamental Constant V	[TuC2] Power I
14:30							
15:00		Coffee					
15:30					[TuP] Poster Session I (109+110+111)		
16:00		[MoA3] Voltage (DC/AC) III			[MoB3] Fundamental Constant III	[MoC3] Time & Frequency III	
16:30							
17:00							
17:30							
18:00	Welcome Reception (Lobby 1F)		Exhibitors' Reception				
18:30							
20:00							
20:30							
21:00							
21:30							

	Wednesday, June 16				Thursday, June 17			Friday, June 18												
	Room (101+102)	Room (103+104)	Room (105+106)	Room (107)	Room (101+102)	Room (103+104)	Room (105+106)	Room (101+102)	Room (103+104)	Room (105+106)										
7:30	Speaker's Breakfast																			
8:00																				
8:30																				
9:00	[PS4] Plenary Session 4 • Y. K. Park • E. So (201)				[SS] Special Session • Seungll Moon • G. Rietveld • D. A. Wollman (201)			[FrA1] Current (DC/AC) II	[FrB1] Resistance II	[FrC1] Radio Frequency IV										
9:30																				
10:00																				
10:30	Coffee																			
11:00	[WeA1] Magnetism I	[WeB1] Impedance (LF) I	[WeC1] Radio Frequency I		[ThA1] High Voltage/ High Current I	[ThB1] Impedance (LF) III	[ThC1] Radio Frequency II	Closing / Introduction of CPEM 2012 (201)												
11:30																				
12:00																				
12:30	Lunch (112)																			
13:00																				
13:30																				
14:00	[WeA2] Magnetism II	[WeB2] Impedance (LF) II	[WeC2] Device & Materials		[ThA2] High Voltage/ High Current II	[ThB2] Resistance I	[ThC2] Radio Frequency III	KRISS Lab Tour												
14:30				AMTA Special Session	[ThP] Poster Session III (109+110+111)															
15:00	[WeP] Poster Session II (109+110+111)				[ThP] Poster Session III (109+110+111)															
15:30																				
16:00																				
16:30																				
17:00																				
17:30																				
18:00																				
18:30																				
20:00	Awards & Banquet (201+202)																			
20:30																				
21:00																				
21:30																				

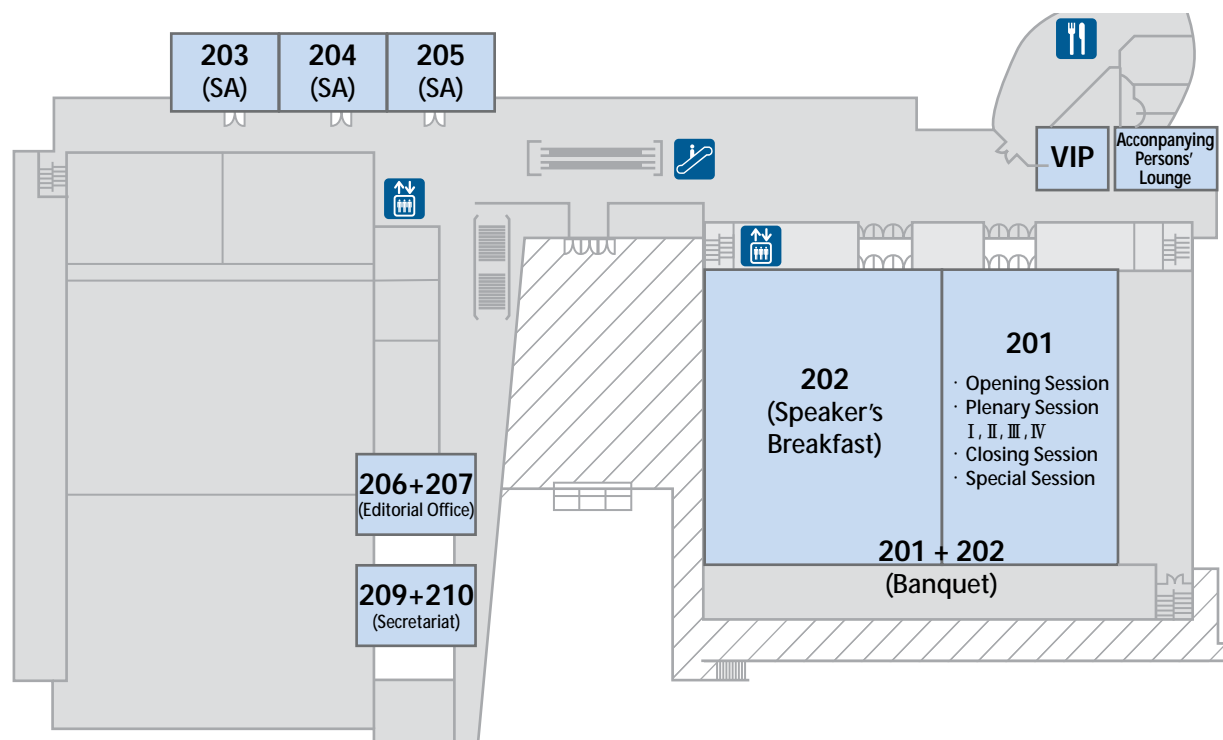


FLOOR PLAN

First Floor



Second Floor



It is my great pleasure and honor to welcome you to Daejeon, Korea for the 2010 Conference on Precision Electromagnetic Measurements (CPEM 2010).

Hosted by the Korea Research Institute of Standards and Science (KRIS), CPEM 2010 continues a series of conferences that are the premier forum for quantum devices that relate electrical standards to fundamental constants and the international system of units.

This year, despite a global economic recession, a large number of high quality, diverse, and creative abstracts were submitted to this conference. The CPEM 2010 Technical Committee members undertook the most challenging task of selecting 392 papers. In order to contribute to the highest level of advancement in research and actual fields of application, high standards were applied to the selection process through the use of a peer review. As a result, the conference offers 6 plenary talks as well as oral and poster presentations. In addition, CPEM 2010 features invited lectures addressing the global agenda of "Low Carbon, Green Growth" to be delivered by a distinguished group of speakers working at the frontiers of measurement science and technology. These presentations reflect the finest research works and latest findings in electromagnetic measurements.

We are absolutely pleased to invite you to the wonderful city of Daejeon, with Daedeok Innopolis (Daedeok Science Town), Korea's center of science and technology, creating a perfect setting for the CPEM 2010.

CPEM 2010's highly motivated organizing committee members have been dedicated to make this conference in Korea both unforgettable and scientifically exceptional. I would like to thank all of the committee members who worked extraordinarily hard to produce an exciting technical program and fabulous conference experience.

I sincerely hope the conference enhances your research for the upcoming years and provides you with an invaluable experience.

Myungsoo Kim, Ph.D.
 Conference Chair of CPEM 2010
 President, Korea Research Institute of Standards and Science (KRIS)





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HONORARY COMMITTEE

• Ali Abulezz	(NIS, Egypt)
• João Alziro Herz Da Jornada	(INMETRO, Brazil)
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• Christian Bock	(METAS, Switzerland)
• Brian Bowsher	(NPL, UK)
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• Albert Dalhuijsen	(VSL, The Netherlands)
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• Barry Inglis	(NMIA, Australia)
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• Pavel Klenovsky	(CMI, Czech Republic)
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• Andrew J. Wallard	(BIPM, France)
• Vu Khanh Xuan	(VMI-STAMEQ, Vietnam)
• Yukuan Zhang	(NIM, China)



ORGANIZNG COMMITTEE

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- Conference Secretariat Yonuk Chong (KRISS)
- Technical Committee Chair Kyu-Tae Kim (KRISS)
- Technical Committee Co-Chair Taeg Yong Kwon (KRISS)
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- Early Career Program Po Gyu Park (KRISS)
- Jisoo Hwang (KRISS)
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- Min Young Kim (KRISS)
- Jae Sung Pae (KRISS)
- Sang Wook Seo (KRISS)
- Do Young Lee (KRISS)
- Dong-Joon Lee (KRISS)
- Song-I Kim (Genicom Co., Ltd.)
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- Digest Associate Editor
- Guest Editor of IEEE Trans. IM
- Associate Guest Editor Trans. IM
- Treasurer
- Sponsor Relations
- Publicity Chair
- International Cooperation
- KRISS Laboratory Tour
- Conference Manager

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- Koji Komiyama (NMIJ, Japan)
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- Yasuhiro Nakamura (NMIJ, Japan)
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- Francois Piquemal (LNE, France)
- Nick Ridler (NPL, UK)
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- Juris Rungis (NMIA, Australia)
- Anil Kishore Saxena (NPLI, India)
- Yueyan Shan (NMC/A*STAR, Singapore)
- Efim Shapiro (VNIIM, Russia)
- Eddy So (NRC-CNRC, Canada)
- Yang Sup Song (KRISS, Korea)
- Zhang Tieren (NMIA, Australia)
- Martin Wicks (NPL, UK)
- Paul Wright (NPL, UK)



U-Lim park



PLENARY TALKS

Monday, June 14, 2010

- 09:00 – 10:00 **“QUANTUM METROLOGY – FULFILLING THE DREAM”**
Bryan Kibble
Independent Consultant (formerly with NPL), UK
- 10:00 – 10:30 **“THE CIPM MRA: SOME REFLECTIONS AFTER 11 YEARS OF OPERATION”**
Andrew J. Wallard
Bureau International Des Poids et Mesures, France

Tuesday, June 15, 2010

- 09:00 – 09:45 **“OPTICAL LATTICE CLOCKS AND FREQUENCY COMPARISONS”**
Hidetoshi Katori
The University of Tokyo, Japan
- 09:45 – 10:30 **“HYBRID SINGLE-ELECTRON TURNSTILE- TOWARDS A QUANTUM STANDARD OF ELECTRIC CURRENT”**
Jukka Pekola
Helsinki University of Technology, Finland

Wednesday, June 16, 2010

- 09:00 – 09:45 **“LOW-NOISE SUPERCONDUCTING QUANTUM INTERFERENCE DEVICES FOR MEASURING BRAIN AND CARDIAC MAGNETIC SIGNALS”**
Yong Ki Park
Korea Research Institute of Standards and Science, Korea
- 09:45 – 10:30 **“THE ROLE OF AN NMI IN PROVIDING SUPPORT TO THE ELECTRICAL POWER INDUSTRY IN THE ERA OF SMART GRID”**
Eddy So
National Research Council of Canada, Canada

CONFERENCE/GENERAL INFORMATION

CONFERENCE INFORMATION

• Conference Location

All scientific sessions will be held at:
Daejeon Convention Center (DCC)
4-19 Doryoung-dong, Yuseong-gu, Daejeon, Korea
Tel: +82-42-821-0114

• Registration Desk

The registration desk will be open during the following times:
Sunday, June 13, 2010, 2:00 pm ~ 8:30 pm
Monday–Thursday, June 14 ~17, 2010, 7:00 am ~ 7:00 pm
Friday, June 18, 2010, 7:00 am ~ 12:30 pm
If you need any assistance, please contact the CPEM 2010 Secretariat on (042) 472-7464.

• Speaker Preparation Room

Room: 108 (1F)
Hours of Operation:
Sunday, June 13, 2:00 pm ~ 8:00 pm
Monday, June 14, 8:30 am ~ 6:00 pm
Tuesday, June 15, 8:30 am ~ 6:00 pm
Wednesday, June 16, 8:30 am ~ 6:00 pm
Thursday, June 17, 8:30 am ~ 6:00 pm

***Oral Presenters** must upload an electronic version of their presentation (PowerPoint or PDF Format) **at least one hour prior to their presentation** onto the laptop provided in the Presentation.

• Internet Lounge

Location: 1F Lobby
Hours of Operation:
Sunday, June 13, 2010, 2:00 pm ~ 6:00 pm
Monday ~ Thursday, June 14 ~ 17, 2010, 8:00 am ~ 6:00 pm
Friday, June 18, 2010, 8:00 am ~ 11:00 am

The Internet Lounge provides computers where attendees can access the internet and check e-mails. For those with their own laptops, there will be wireless LAN available at the Internet Lounge.



CONFERENCE/GENERAL INFORMATION

• Editorial Office

Room: 206+207 (2F)

Hours of Operation:

Sunday, June 13, 2010, 2:00 pm ~ 8:00 pm

Monday~Thursday, June 14 ~ 17, 2010, 7:00 am ~ 8:00 pm

Friday, June 18, 2010, 7:00 am ~ 11:00 am

*Authors of summary papers accepted for presentation at CPEM 2010 have been encouraged to submit an extended (6 pages) version of their paper for review and possible publication in the CPEM 2010 Special Issue of the IEEE Transactions on Instrumentation and Measurement (TIM). Submission is via an online (AllenTrack) system. The AllenTrack system will be open for paper submissions two weeks prior to the opening of the conference (May 30, 2010) and close for submissions just before the opening of the conference (June 12, 2010, local time and date). Authors are encouraged to submit their manuscript as early as possible.

Full instructions for extended-paper submission are available on the CPEM 2010 website <<http://cpem2010.kriss.re.kr/sub06.php>>

• Satellite Meetings

Thirteen satellite meetings will be held at the DCC and KRISS combined in conjunction with CPEM 2010, in the days before, during and after the conference. See page 60 for a listing (accurate at time of printing, but subject to change) of these meetings.

• Exhibit Schedule

Room: 109+110+111 (1F)

Exhibitor Move In: Sunday, June 13, 2010, 3pm ~ 6pm

Show Hours: Monday, June 14, 2010 ~ Thursday, June 17, 2010, 9:00 am ~ 6:00 pm

Exhibitor Dismantling: Thursday, June 17, 2010, 6:00pm ~

For a listing of exhibitors, see page 62.

• Speaker's Breakfast

Room: 202 (2F)

Oral presenter and all session chairs are encouraged to attend the Speaker's Breakfast on the day of their presentation/session, to meet one another and to receive last-minute instructions/updates from conference organizers. If an oral presenter cannot attend the Speaker's Breakfast, please notify the session chair of your presence before the start of the session so he/she knows you are present.

• Lunches

CPEM 2010 lunches will be served in the room 112 (1F). Attendees must submit lunch coupons for 4 days to be served complimentary CPEM lunches.

• Receptions and Banquet

The Welcome Reception will be held on Sunday evening, June 13, 2010 (18:00 ~ 20:00), in the Lobby (1F).

Following the technical sessions on Monday afternoon, June 14, 2010 (18:00 ~ 20:00), there will be an Exhibitors' Reception consisting of beverages and light refreshments in the exhibition hall (109+110+111).

The conference Banquet will be held on Wednesday evening, June 16, 2010 (18:30 ~ 21:30), in room 201+202 (2F).



CONFERENCE/GENERAL INFORMATION

• Name Badges

All attendees must wear their name badge at all times to gain admission to all sessions, exhibits, lunches, and receptions.

• KRISS Lab Tour

For the KRISS Lab Tour on Friday afternoon, confirmed tour participants will receive all current and necessary information for the KRISS tour as part of their registration packet upon check-in at registration. The bus will depart from DCC at 12:00 in front of the main gate.

• Accompanying Persons' Lounge

Location: In front of Room 201 (2F)

Hours of Operation: Monday ~ Friday, June 14~17, 2010, 9:00am ~ 6:00pm

The first 'Get Together' will be held on Monday, June 14, 2010 at 10:30

GENERAL INFORMATION

• Cellular Phones and Watch Alarms

Out of courtesy to our speakers and other attendees, please turn off any cellular phones and watch alarms during sessions.

• Smoking

All meeting rooms and seated functions are smoke free. Please adhere to the smoking policy of the Daejeon Convention Center.

• Electricity

In Korea, an outlet for 220 Volt is most common. Overseas delegates bringing laptop computers and other electrical appliances are advised to check whether a transformer is required.

• Currency Exchange

Only Korea currency (Won) is acceptable at regular stores and restaurants. The unit of Korean currency is the Korean Won (₩). Coin denominations are ₩10, ₩50, ₩100, ₩500. Banknotes are ₩1,000, ₩5,000, ₩10,000 and ₩50,000. As of June 1, 2010, the exchange rate is approximately USD 1 to KRW 1,227.00.

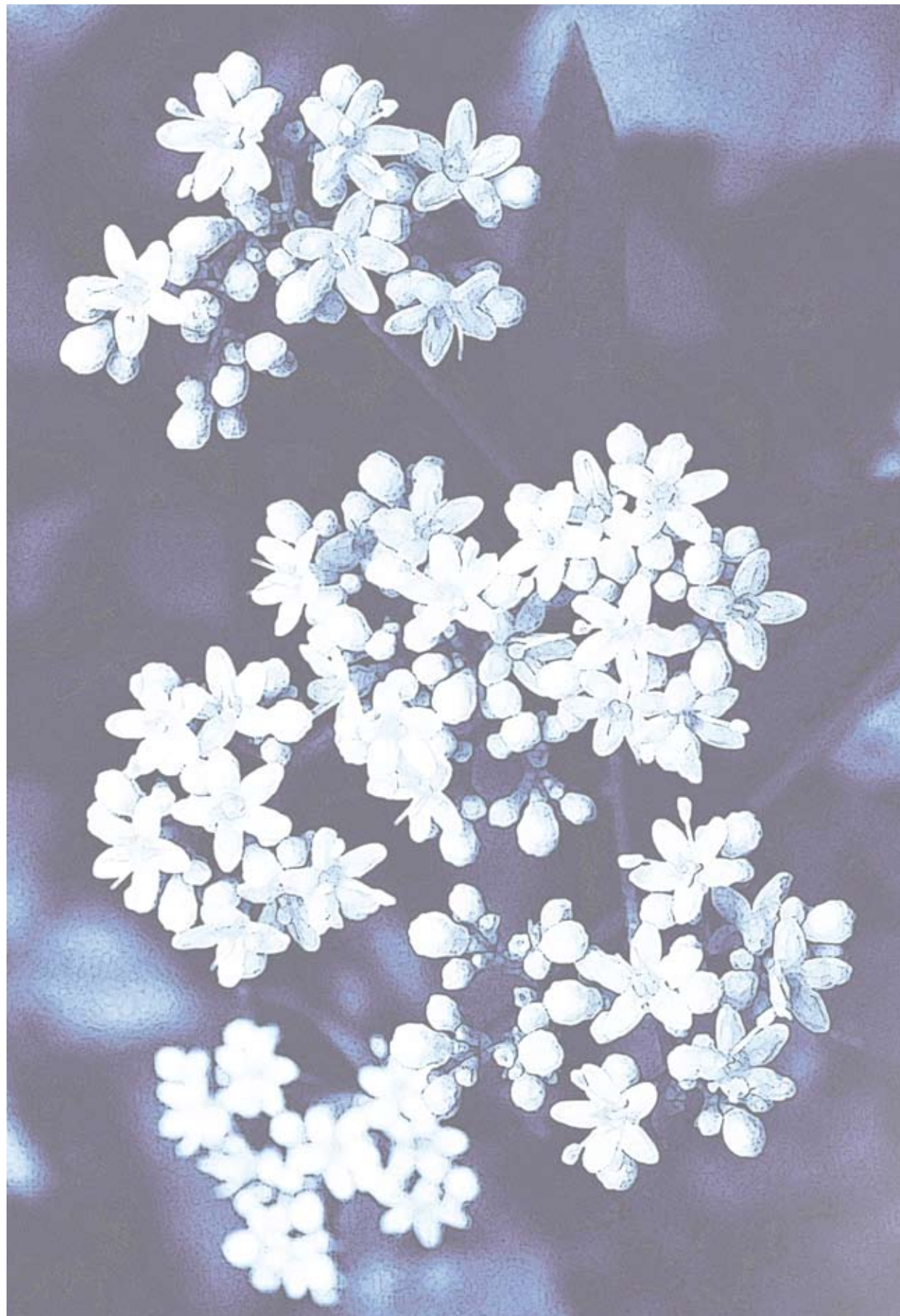
• Credit Cards

Credit cards including MasterCard and VISA are accepted at most hotels, restaurants, department stores and souvenir shops.

• Tipping Standards

Tipping is not customary in Korea. Service Charges are included in your bill on the price of rooms, meals, and other services at hotels and quality restaurants.





TECHNICAL PROGRAM

Information on Technical Program

• Information for Session Chairs

The chair of each session is requested to arrive at the session room at least 10 minutes before the session starts, and to check the attendance of speakers in the session according to the schedule. Each oral presentation is 20 minutes long including discussion. The session chair will ring a bell one at 10 minutes after start, and twice at 18 minutes and the session chair is recommended to advise speakers who bring their own notebook computers to have the compatibility check before the session begins.

• Information for Oral Presentations

Presenters are required to report to the session chair before the session starts. Each oral presentation is limited to 20 minutes including discussion. The session chair will ring a bell one at 10 minutes after start, and twice at 18 minutes. It is important to stay on schedule so that people moving between sessions can hear the presentations interesting to them. The session room will be equipped with a laptop with an LCD Projector. Presenters can use their own notebook computers or load their presentation materials from their CD-ROMs or USB memory sticks before the beginning of the session.

• Information for Poster Presentations

Poster session will be held in room 109+110+111 (1F) on assigned days during the conference. The size of each poster panel is 0.9 m in width and 2 m in height. Each paper's code will be shown on the board. The presenter can put up the materials on the board using adhesive tapes before presentation during the conference. The posters should be removed after the session. All presenters are required to preside at their poster panel during the session for anticipated discussion with participants.

• Guide to Understanding Session Numbering

Each session in the technical program is assigned a unique number which clearly indicates when and where the session is presented. The number of each session is shown before the session title.

Typical session number: MoA1

- ▶ The first two character (Mo) indicates the day of the conference – Monday
- ▶ The third character (A) indicates which room the session is held – A room (101+102)
- ▶ The forth number (1) shows which time of day the session is held.

EXAMPLE	1st & 2nd Character	3rd Character	4th Number
MoA1	Mo Monday	A 101+102	1 Morning
	Tu Tuesday	B 103+104	2 Afternoon
	We Wednesday	C 105+106	3 Late afternoon
	Th Thursday		
	Fr Friday		



TECHNICAL PROGRAM

June 14, 2010 (Monday)

Room 202
07:30 ~ 09:00 Speaker's Breakfast
Room 201
[Plenary Session 1] SI Units, Realization and Redefinition Chair: Chris Sutton (Industrial Research Ltd., New Zealand)
09:00 ~ 10:00 [PS1] "QUANTUM METROLOGY – FULFILLING THE DREAM" Bryan Kibble Independent Consultant (formerly with NPL, UK)
Room 201
[Plenary Session 2] Global MRA Chair: Sam-Yong Woo (KRISS, Korea)
10:00 ~ 10:30 [PS2] "THE CIPM MRA: SOME REFLECTIONS AFTER 11 YEARS OF OPERATION" Andrew J. Wallard Bureau International des Poids et Mesures (BIPM), France
Lobby (2F)
10:30 ~ 11:00 Coffee Break
Room 201
11:00 ~ 11:30 Opening Session

June 14, 2010 (Monday)

Room 101+102	Room 103+104	Room 105+106
[MoA1] Voltage (DC/AC) I Chair: Laurie Christian (MSL, NewZealand)	[MoB1] Fundamental Constant I Chair: Barry Wood (NRC-CNRC, Canada)	[MoC1] Time & Frequency I Chair: Luc Erard (LNE, France)
11:30 ~ 12:30		
[MoA1-1] AUTOMATION OF DIRECT JOSEPHSON VOLTAGE STANDARD COMPARISON AND AN APPLICATION Y. Tang National Institute of Standards and Technology (NIST), USA	[MoB1-1] HETERODYNE INTERFEROMETRIC DISPLACEMENT MEASUREMENT IN MAGNETIC ENERGY BALANCE Liqiong Zhang, Yan Li, and Zhen Liu Tsinghua University, China	[MoC1-1] TOWARDS A COMPACT OPTICAL FIBRE CLOCK A. Lurie ¹ , C. R. Locke ¹ , C. Perrella ¹ , P. S. Light ¹ , F. Benabid ² , and A. N. Luiten ¹ ¹ The University of Western Australia, Australia, ² University of Bath, UK
[MoA1-2] MINIMIZING VOLTAGE LEAD CORRECTIONS FOR A PULSE-DRIVEN JOSEPHSON VOLTAGE STANDARD Helko E. van den Brom and Ernest Houtzager VSL Dutch Metrology Institute, The Netherlands	[MoB1-2] THE MEASUREMENT OF GRAVITATIONAL ACCELERATION FOR THE NRC WATT BALANCE A. D. Inglis ¹ , J. O. Liard ² , C. G. L. Gagnon ² , R. J. Silliker ² , and I. A. Robinson ³ ¹ National Research Council (NRC), Canada, ² Natural Resources Canada, Canada, ³ National Physical Laboratory (NPL), UK	[MoC1-2] A NEW CLOCK LASER SYSTEM FOR AN Yb OPTICAL LATTICE CLOCK USING A FIBRE-BASED FREQUENCY COMB STABILIZED TO A NARROW LINEWIDTH LASER AT 1064nm K. Hosaka ^{1,2} , H. Inaba ^{1,2} , Y. Nakajima ^{1,2,3} , K. Iwakuni ^{1,4} , M. Yasuda ^{1,2} , T. Kohno ^{1,2} , D. Akamatsu ^{1,2} , A. Onae ¹ , and F.-L. Hong ^{1,2} ¹ National Institute of Advanced Industrial Science and Technology (AIST), Japan ² Japan Science and Technology Agency, Japan ³ University of Fukui, Japan ⁴ Keio University, Japan
[MoA1-3] GENERATION OF AC WAVEFORMS USING A NbN-BASED PROGRAMMABLE JOSEPHSON VOLTAGE STANDARD SYSTEM WITH A 10-K COOLER M. Maruyama, T. Yamada, H. Sasaki, H. Yamamori, C. Urano, and N. Kaneko National Institute of Advanced Industrial Science and Technology (AIST), Japan	[MoB1-3] IN SITU CORRECTION OF ABBE OFFSET ERROR IN THE WATT BALANCE EXPERIMENT D. Haddad, R. Steiner, E. Williams, and R. Liu National Institute of Standards and Technology (NIST), USA	[MoC1-3] ¹⁷¹Yb⁺ SINGLE-ION OPTICAL FREQUENCY STANDARDS Chr. Tamm, B. Lipphardt, S. Weyers, N. Huntemann, M. Okhapkin, I. Sherstov, and E. Peik Physikalisch-Technische Bundesanstalt (PTB), Germany
Room 112		
12:30 ~ 14:00 Lunch		



TECHNICAL PROGRAM

June 14, 2010 (Monday)

Room 101+102	Room 103+104	Room 105+106
[MoA2] Voltage (DC/AC) II Chair: Samuel Benz (NIST, USA)	[MoB2] Fundamental Constant II Chair: Petr Mohr (NIST, USA)	[MoC2] Time & Frequency II Chair: Alan Madej (NRC-CNRC, Canada)
14:00 ~ 16:00		
[MoA2-1] ESTABLISHING AN AC JOSEPHSON VOLTAGE STANDARD AT NRC P. S. Filipksi ¹ , M. Boecker ¹ , S. P. Benz ² , and C. J. Burroughs ² ¹ National Research Council of Canada (NRC), Canada ² National Institute of Standards and Technology (NIST), USA	[MoB2-1] UPGRADING THE NIST ELECTRONIC KILOGRAM SYSTEM R. Steiner, D. Haddad, R. Liu, and E. Perl National Institute of Standards and Technology (NIST), USA	[MoC2-1] IMPLEMENTATION OF SWITCHING CONTROLLER FOR PRECISE NETWORK TIME SYNCHRONIZATION I. C. Chao ¹ , K. Y. Tu ² , S. Y. Lin ³ , and F. R. Chang ¹ ¹ National Taiwan University, Taiwan ² Vanung University, Taiwan ³ Telecommunication Laboratories Chunghwa Telecom Co., Ltd., Taiwan
[MoA2-2] DESIGN OF THE NIST 10 V PROGRAMMABLE JOSEPHSON VOLTAGE STANDARD SYSTEM C. J. Burroughs ¹ , P. D. Dresselhaus ¹ , A. Rüfenacht ² , M. M. Elsbury ¹ , and S. P. Benz ¹ ¹ National Institute of Standards and Technology (NIST), USA ² Federal Office of Metrology (METAS), Switzerland	[MoB2-3] DETERMINATION AND MINIMIZATION OF PARASITIC FORCES AND MOMENTS IN THE STATIC STEP OF THE LNE WATT BALANCE EXPERIMENT F. Villar ¹ , G. Genevès ¹ , and J. David ² ¹ Laboratoire National de métrologie et d'Essais (LNE), France ² Arts et Métiers ParisTech, France	[MoC2-2] TRANSPORTABLE DISTANCE MEASUREMENT SYSTEM FOR LONG RANGE APPLICATIONS S. Azouigui, T. Badr, J.-P. Wallerand, M. Himbert, J. Salgado, and P. Juncar Laboratoire Commun de Métrologie (LNE-CNAM), France
[MoA2-3] AN ANALYSIS OF LOW FREQUENCY PROPERTIES IN A THERMAL CONVERTER Y. Amagai and Y. Nakamura National Metrology Institute of Japan/ National Institute of Advanced Industrial Science and Technology, Japan	[MoB2-4] DIRECT COMPARISON OF THE NRC HYSTERETIC AND THE NRC WATT BALANCE PROGRAMMABLE JOSEPHSON VOLTAGE SYSTEMS B. M. Wood ¹ , I. A. Robinson ² , and C. Sanchez ¹ ¹ National Research Council of Canada (NRC), Canada ² National Physical Laboratory (NPL), UK	[MoC2-3] ON THE RELATIVISTIC RATE SHIFT OF FREQUENCY STANDARDS Gérard Petit Bureau International des Poids et Mesures (BIPM), France
[MoA2-4] A PRECISION BUFFER AMPLIFIER FOR LOW-FREQUENCY METROLOGY APPLICATIONS I. Budovsky and T. Hagen National Measurement Institute, Australia	[MoB2-5] FIRST MUONIC HYDROGEN LASER SPECTROSCOPY: NEW DETERMINATION OF THE PROTON CHARGE RADIUS F. Nez CREMA (Charge Radius Experiment with Muonic Atoms) collaboration, Laboratoire Kastler Brossel, CNRS, UPMC, France	[MoC2-4] OPERATION OF THE CAESIUM FOUNTAIN FREQUENCY STANDARD NPL-CsF2 AT THE COLLISIONAL SHIFT CANCELLATION POINT K. Szymaniec, S. E. Park, G. Marra, and Y. B. Ovchinnikov National Physical Laboratory (NPL), UK

June 14, 2010 (Monday)

[MoA2-5] PRECISION AC-DC TRANSFER MEASUREMENTS WITH A JOSEPHSON WAVEFORM SYNTHESIZER AND A BUFFER AMPLIFIER O. Séron ¹ , I. Budovsky ² , S. Djordjevic ¹ , T. Hagen ² , R. Behr ³ , and L. Palafox ³ ¹ Laboratoire National de métrologie et d'Essais (LNE), France ² National Measurement Institute, Australia ³ Physikalisch-Technische Bundesanstalt (PTB), Germany		[MoC2-5] TACKLING THE BLACK BODY SHIFT IN A STRONTIUM LATTICE CLOCK Ch. Lisdat, Th. Middelmann, St. Falke, J. S. R. Vellore Winfred, F. Riehle, and U. Sterr Physikalisch-Technische Bundesanstalt (PTB), Germany
Lobby (1F)		
16:00 ~ 16:30		
Coffee Break		
Room 101+102	Room 103+104	Room 105+106
[MoA3] Voltage (DC/AC) III Chair: Ralf Behr (PTB, Germany)	[MoB3] Fundamental Constant III Chair: Gerard Geneves (LNE, France)	[MoC3] Time & Frequency III Chair: Krzysztof Szymaniec (NPL, UK)
16:30 ~ 18:00		
[MoA3-1] SYSTEM FOR PRECISION AC-DC DIFFERENCE MEASUREMENTS BASED ON A PROGRAMMABLE JOSEPHSON VOLTAGE STANDARD I. Budovsky, D. Georgakopoulos, and T. Hagen National Measurement Institute, Australia	[MoB3-1] CONSEQUENCES OF LORENTZ INVARIANCE: A ROAD TOWARDS FIRST PRINCIPLE STANDARDS FOR MAGNETIC FIELD AND MASS Jos A. A. J. Perenboom and Charles M. E. E. Peters Radboud University Nijmegen, The Netherlands	[MoC3-1] PROGRESS IN BUILDING OF CESIUM FOUNTAIN FREQUENCY STANDARD AT NPL, INDIA Amitava Sen Gupta, Ashish Agarwal, Poonam Arora, and Kavindra Pant National Physical Laboratory (NPL), India
[MoA3-2] COMPARISON OF NIM AND BIRMM PROGRAMMABLE JOSEPHSON VOLTAGE STANDARDS Yuan Gao ¹ , Honghui Li ¹ , Zengmin Wang ¹ , Yan Kang ² , Lu Wang ² , Hui Zhang ² , and Zhu Zhu ² ¹ National Institute of Metrology (NIM), China ² Beijing Institute of Radio Metrology and Measurement, China	[MoB3-2] THE BIPM WATT BALANCE: IMPROVEMENTS AND DEVELOPMENTS A. Picard ¹ , M.P. Bradley ^{1,2} , H. Fang ¹ , A. Kiss ¹ , E. de Mirandés ¹ , B. Parker ³ , S. Solve ¹ , and M. Stock ¹ ¹ Bureau International des Poids et Mesures (BIPM), France, ² University of Saskatchewan, Canada ³ Massachusetts Institute of Technology (MIT), USA	[MoC3-2] TOWARDS THE ESTABLISHMENT OF A CESIUM FOUNTAIN CLOCK AT CENAM J. M. López-Romero, E. de Carlos L. S. López-López, N. Shtin, M. Espinosa O., and L. A. Lizama P. Centro Nacional de Metrologia, Mexico



TECHNICAL PROGRAM

June 14, 2010 (Monday)

June 14, 2010 (Monday)

<p>[MoA3-3] TRANSITION SHAPE EFFECT IN THE TRANSIENTS GENERATED BY A PROGRAMMABLE JOSEPHSON VOLTAGE STANDARD B. Jeanneret¹, F. Overney¹, A. Rüfenacht¹, and J. Nissilä² ¹Federal Office of Metrology (METAS), Switzerland ²Center for Metrology and Accreditation (MIKES), Finland</p>	<p>[MoB3-3] COMPARISON OF 3 ABSOLUTE GRAVIMETERS BASED ON DIFFERENT METHODS FOR THE e-MASS PROJECT S. Merlet¹, G. D'Agostino², A. Germak², H. Baumann³, Q. Bodart¹, A. Louchet¹, A. Landragin¹, and F. Pereira dos Santos¹ ¹Laboratoire National de métrologie et d'Essais-Systeme de References Temps-Espace (LNE-SYRTE), France ²Istituto Nazionale di Ricerche Metrologica (INRIM), Italy ³Federal Office of Metrology (METAS), Switzerland</p>	<p>[MoC3-3] PROGRESS IN THE EVALUATION AND OPERATION OF THE NRC STRONTIUM SINGLE ION FREQUENCY STANDARD AS AN OPTICAL ATOMIC CLOCK A. A. Madej¹, P. Dubé¹, J. E. Bernard¹, G. Humphrey¹, M. Vainio², J. Jiang³, and D. J. Jones³ ¹National Research Council of Canada (NRC), Canada ²Centre for Metrology and Accreditation (MIKES), Finland ³University of British Columbia, Canada</p>
<p>[MoA3-4] DEVELOPMENT AND INVESTIGATION OF INTRINSICALLY SHUNTED JUNCTION SERIES ARRAYS FOR AC JOSEPHSON VOLTAGE STANDARDS J. Kohlmann¹, F. Müller¹, O. F. Kieler¹, D. Schleußner¹, B. Egeling¹, R. Behr¹, D. Olaya², P. D. Dresselhaus², and S. P. Benz² ¹Physikalisch-Technische Bundesanstalt (PTB), Germany ²National Institute of Standards and Technology (NIST), USA</p>	<p>[MoB3-4] QUANTUM METROLOGICAL TRIANGLE EXPERIMENT: QUANTIZATION TESTS OF THE ELECTRON PUMP S. Sassine¹, N. Feltin¹, L. Devoille¹, W. Poirier¹, F. Schopfer¹, S. Djordjevic¹, O. Seron¹, F. Piquemal¹, and S. Lotkhov² ¹Laboratoire National de Métrologie et d'Essais (LNE), France ²Physikalisch-Technische Bundesanstalt (PTB), Germany</p>	<p>[MoC3-4] CHARACTERIZATION OF THE DISTRIBUTED CAVITY PHASE SHIFT IN LNE-SYRTE FO₂ FOUNTAIN J. Guéna¹, P. Rosenbusch¹, Ph. Laurent¹, M. Abgrall¹, D. Rovera¹, G. Santarelli¹, M. E. Tobar¹, K. Gibble², S. Bize¹, and A. Clairon¹ ¹Laboratoire National de métrologie et d'Essais-Systeme de References Temps-Espace (LNE-SYRTE), France ²The Pennsylvania State University, USA</p>
<p>[MoA3-5] IMPEDANCE MEASUREMENTS WITH PROGRAMMABLE JOSEPHSON SYSTEMS Jinni Lee¹, Jürgen Schurr¹, Jaani Nissilä², Luis Palafox¹, and Ralf Behr¹ ¹Physikalisch-Technische Bundesanstalt (PTB), Germany ²Centre for Metrology and Accreditation (MIKES), Finland</p>	<p>[MoB3-5] VOLTAGE TRACEABILITY OF JOHNSON NOISE THERMOMETRY BY AC-DC TRANSFER METHOD F. Manta^{1,2}, L. Callegaro¹, M. Pisani¹, M. Ortolano², and V. D'Elia¹ ¹Istituto Nazionale di Ricerca Metrologica (INRIM), Italy ²Politecnico di Torino, Italy</p>	<p>[MoC3-5] ABSOLUTE FREQUENCY MEASUREMENT OF ¹⁷¹Yb IN A ONE-DIMENSIONAL OPTICAL LATTICE Takuya Kohno^{1,2}, Masami Yasuda^{1,2}, Kazumoto Hosaka^{1,2}, Hajime Inaba^{1,2}, and Yoshiaki Nakajima^{1,2,3}, Daisuke Akamatsu^{1,2}, and Feng-Lei Hong^{1,2} ¹National Institute of Advanced Industrial Science and Technology (AIST), Japan ²Japan Science and Technology Agency, Japan ³University of Fukui, Japan</p>

<p>[MoA3-6] COMPARISON OF A LOCK-IN AMPLIFIER AND A DIGITAL SAMPLING VOLTMETER AS NULL DETECTORS FOR DIFFERENTIAL MEASUREMENTS BETWEEN SINUSOIDAL AND STEPWISE APPROXIMATED AC SIGNALS D. Georgakopoulos¹, I. Budovsky¹, and L. Palafox² ¹National Measurement Institute, Australia ²Physikalisch-Technische Bundesanstalt (PTB), Germany</p> <p>[MoA3-7] FREQUENCY CHARACTERISTICS OF CALCULABLE THIN-FILM MULTI-JUNCTION THERMAL CONVERTERS ABOVE 1 MHz H. Fujiki and Y. Amagai National Institute of Advanced Industrial Science and Technology (AIST), Japan</p>	<p>[MoB3-6] REDUCED NONLINEARITIES IN THE NIST JOHNSON NOISE THERMOMETRY SYSTEM Jifeng Qu, S. P. Benz, A. Pollarolo, and H. Rogalla National Institute of Standards and Technology (NIST), USA</p>	<p>[MoC3-6] TOWARD A MERCURY OPTICAL LATTICE CLOCK: DEVELOPMENT OF A DIPOLE LATTICE TRAP AT THE MAGIC WAVELENGTH J. J. McFerran, S. Mejri, L. Yi, and S. Bize Laboratoire National de métrologie et d'Essais-Systeme de References Temps-Espace (LNE-SYRTE), France</p>
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109+110+111

18:00 ~ 20:00
Exhibitors' Reception



TECHNICAL PROGRAM

June 15, 2010 (Tuesday)

Room 202
07:30 ~ 09:00 Speaker's Breakfast
Room 201
[Plenary Session 3] Optical Lattice Clock and Single-electron Pumping Chair: Ho-Seong Lee (KRISS, Korea)
09:00 ~ 09:45 [PS3-1] "OPTICAL LATTICE CLOCKS AND FREQUENCY COMPARISONS" Hidetoshi Katori The University of Tokyo, Japan
09:45 ~ 10:30 [PS3-2] "HYBRID SINGLE-ELECTRON TURNSTILE – TOWARDS A QUANTUM STANDARD OF ELECTRIC CURRENT" J. P. Pekola ¹ , D. V. Averin ² , S. Kafanov ¹ , A. Kemppinen ³ , S. V. Lotkhov ⁴ , V. F. Maisi ³ , M. Meschke ¹ , M. Möttönen ¹ , Yu. A. Pashkin ⁵ , O.-P. Saira ¹ , J. S. Tsai ⁵ , and A. B. Zorin ⁴ ¹ Helsinki University of Technology, Finland ² Stony Brook University, USA ³ Center for Metrology and Accreditation (MIKES), Finland ⁴ Physikalisch-Technische Bundesanstalt (PTB), Germany ⁵ The Institute of Physical and Chemical Research (RIKEN), Japan
Lobby (1F)
10:30 ~ 11:00 Coffee Break

June 15, 2010 (Tuesday)

Room 101+102	Room 103+104	Room 105+106
[TuA1] Voltage (DC/AC) IV Chair: Ilya Budovsky (NMIA, Australia)	[TuB1] Fundamental Constant IV Chair: Peter Becker (PTB, Germany)	[TuC1] Time & Frequency IV Chair: Feng Lei Hong (AIST, Japan)
11:00 ~ 12:30		
<p>[TuA1-1] LINKING AC QUANTUM SYSTEMS USING A THERMAL CONVERTER Thomas E. Lipe, Joseph R. Kinard, Bryan C. Waltrip, and Yi-hua Tang National Institute of Standards and Technology (NIST), USA</p> <p>[TuA1-2] AC-DC DIFFERENCE MEASUREMENTS RELATIVE TO JOSEPHSON GENERATED VOLTAGES L. Palafox, R. Behr, and T. Funck Physikalisch-Technische Bundesanstalt, Germany</p> <p>[TuA1-3] OPERATION OF THE AC QUANTUM VOLTMETER AT KHZ FREQUENCY Ralf Behr¹, Dale Henderson², Jonathan Williams², Luis Palafox¹, Jinni Lee¹, and John Pickering³ ¹Physikalisch-Technische Bundesanstalt (PTB) ²National Physical Laboratory (NPL), UK ³Metron Designs, UK</p> <p>[TuA1-4] DEVELOPMENT OF MJTCS ON FUSED SILICA SUBSTRATES AT NIST T. E. Lipe¹, J. R. Kinard¹, and L. Scarioni² ¹National Institute of Standards and Technology (NIST), USA ²Universidad de Carabobo, Venezuela</p>	<p>[TuB1-1] THE NPL MARK II WATT BALANCE: FINAL MEASUREMENTS AT NPL I. A. Robinson National Physical Laboratory (NPL), UK</p> <p>[TuB1-2] HIGH-PRECISION CAPACITANCE BRIDGE FOR DIELECTRIC-CONSTANT GAS THERMOMETRY B. Fellmuth, H. Bothe, N. Haft, and J. Melcher Physikalisch-Technische Bundesanstalt (PTB), Germany</p> <p>[TuB1-3] MEASUREMENT OF MASS SCALING AND ALTERNATE MATERIALS ON THE NIST ELECTRONIC KILOGRAM SYSTEM R. Steiner, D. Haddad, R. Liu, E. Williams, and S. Davidson National Institute of Standards and Technology (NIST), USA</p> <p>[TuB1-4] RESULTS FROM THE METAS WATT BALANCE A. L. Eichenberger, H. Baumann, B. Jeanneret, and B. Jeckelmann Federal Office of Metrology (METAS), Switzerland</p>	<p>[TuC1-1] FOURIER SPECTROSCOPY WITH FEMTOSECOND FREQUENCY COMB RADIATION P. Balling, P. Mašika, and P. Křen Czech Metrology Institute, Czech Republic</p> <p>[TuC1-2] FABRY-PEROT DISPLACEMENT INTERFEROMETRY FOR NEXT-GENERATION CALCULABLE CAPACITOR M. Durand, J. Lawall, and Y. Wang National Institute of Standards and Technology, USA</p> <p>[TuC1-3] SELECTIVE AMPLIFICATION OF OPTICAL FREQUENCY COMB USING ANTI-REFLECT COATED LASER E. B. Kim, C. Y. Park, and S. E. Park Korea Research Institute of Standards and Science (KRISS), Korea</p> <p>[TuC1-4] HYPERFINE STRUCTURE OF MOLECULAR-IODINE ABSORPTION SPECTROSCOPY AT 561NM Tao Yang², Jianping Cao¹, Ye Li, Zhanjun Fang¹, Chunqing Gao², and Erjun Zang¹ ¹National Institute of Metrology (NIM), China ²Beijing Institute of Technology, China</p>



TECHNICAL PROGRAM

June 15, 2010 (Tuesday)

<p>[TuA1-5] 0.1 V TO 1000 V AC VOLTAGE STANDARD IN THE FREQUENCY RANGE OF 10 HZ TO 30 MHZ Yulian M. Tuz, Alexander V. Rakhmailov, Marina V. Dobrolyubova, and Boris P. Khimichenko National Technical University of Ukraine, Ukraine</p>	<p>[TuB1-5] STATUS OF THE NA DETERMINATION BY COUNTING ATOMS IN SILICON CRYSTALS P. Becker¹, H. Bettin¹, M. Borys¹, I. Busch¹, K. Fujii², M. Gray³, M. Krumrey¹, U. Kuertgens¹, G. Mana⁴, P. Manson³, E. Massa⁴, A. Nicolaus¹, A. Picard⁵, D. Schiel¹, and S. Valkiers⁶ ¹Physikalisch-Technische Bundesanstalt (PTB), Germany ²National Metrology Institute of Japan (NMIJ), Japan ³National Measurement Institute, Australia ⁴Istituto Nazionale di Ricerca Metrologica (INRIM), Italy ⁵Bureau International des Poids et Mesures (BIPM), France ⁶Institute for Reference Materials and Measurement, Belgium</p>	<p>[TuC1-5] CW VISIBLE STANDARD SOURCE GENERATED BY SECOND HARMONIC OF INJECTION LOCKED DFB TO OPTICAL FREQUENCY COMB SEEDED WITH 13C2H2 STABILIZED LASER S. H. Lee¹, H. Y. Ryu², Y. P. KIM¹, H. S. Suh², and T. B. Eom² ¹Kyung Hee University, Korea ²Korea Research Institute of Standard and Science (KRISS), Korea</p>
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Room 112
12:30 ~ 14:00 Lunch

Room 101+102	Room 103+104	Room 105+106
[TuA2] Current (DC/AC) I Chair: Blaise Jeanneret (METAS, Switzerland)	[TuB2] Fundamental Constant V Chair: Kenichi Fujii (NMIJ, Japan)	[TuC2] Power I Chair: Hector Laiz (INTI, Argentina)
14:00 ~ 15:30		
<p>[TuA2-1] MAGNETIC FIELD ENHANCED ROBUSTNESS OF QUANTIZED CURRENT PLATEAUS IN SINGLE AND DOUBLE QUANTUM DOT NON-ADIABATIC SINGLE CHARGE PUMPS P. Mirovsky¹, C. Leicht¹, B. Kaestner¹, V. Kashcheyevs², K. Pierz¹, and H. W. Schumacher¹ ¹Physikalisch-Technische Bundesanstalt (PTB), Germany ²University of Latvia, Latvia</p>	<p>[TuB2-1] DIAMETER COMPARISON OF A SILICON SPHERE FOR THE INTERNATIONAL AVOGADRO COORDINATION PROJECT N. Kuramoto¹, K. Fujii¹, A. Nicolaus², G. Bartl², M. Gray³, P. Manson³ and W. Giardini³ ¹National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (NMIJ-AIST), Japan ²Physikalisch-Technische Bundesanstalt (PTB), Germany ³National Measurement Institute (NMI), Australia</p>	<p>[TuC2-1] WIDEBAND PHASE COMPARATOR FOR HIGH CURRENT SHUNTS U. Pogliano, D. Serazio and B. Trinchera Istituto Nazionale di Ricerca Metrologica (INRIM), Italy</p>

June 15, 2010 (Tuesday)

<p>[TuA2-2] A PRACTICAL MEASUREMENT SYSTEM FOR SINGLE-ELECTRON PUMP CURRENTS S. P. Giblin¹ and S. J. Wright² ¹National Physical Laboratory (NPL), UK ²University of Cambridge, UK</p>	<p>[TuB2-2] NEW DETERMINATION OF THE BOLTZMANN CONSTANT WITH AN ACOUSTIC METHOD L. Pitre, F. Sparasci, A. Guillou, D. Truong, Y. Hermier, and M. E. Himbert Laboratoire Commun de Metrologie LNE-CNAM, France</p>	<p>[TuC2-2] APPLICATION OF ADAPTIVE NOISE CANCELLING FILTERS IN AC ELECTRICAL MEASUREMENTS P. S. Wright, P. Clarkson, and M. J. Hall National Physical Laboratory, UK</p>
<p>[TuA2-3] A NOVEL PRECISION DC CURRENT SOURCE IN THE Pa RANGE Tobias Bergsten, Karl-Erik Rydler, Ove Gunnarsson, Gunnar Eklund, and Valter Tarasso SP Technical Research Institute of Sweden, Sweden</p>	<p>[TuB2-3] THE CONCEPT OF A PRESSURE BALANCE BASED WATT BALANCE C. M. Sutton, M. P. Fitzgerald, and D. G. Jack Measurement Standards Laboratory of New Zealand, New Zealand Industrial Research Ltd, New Zealand</p>	<p>[TuC2-3] ON-SITE CALIBRATION SYSTEM FOR ISOLATION CURRENT TRANSFORMERS E. Mohns Physikalisch-Technische Bundesanstalt (PTB), Germany</p>
<p>[TuA2-4] DEVELOPMENT OF THE SINUS TURNSTILE FOR THE QUANTUM METROLOGICAL TRIANGLE A. Kemppinen¹, S. Kafanov², V. F. Maisi¹, Yu. A. Pashkin³, S. V. Lotkhov⁴, N. Chekurov², O. -P. Saira², M. Mottonen², J. Hassel⁵, J. S. Tsai³, D. V. Averin⁶, A. B. Zorin⁴, A. J. Manninen¹ and J. P. Pekola² ¹Centre for Metrology and Accreditation (MIKES), Finland ²Aalto University School of Science and Technology, Finland ³NEC Nano Electronics Research Laboratories and RIKEN Advanced Science Institute, Japan ⁴Physikalisch-Technische Bundesanstalt (PTB), Germany ⁵VTT Technical Research Centre of Finland, Finland ⁶Stony Brook University, USA</p>	<p>[TuB2-4] ADVANCES IN THE MEASUREMENT OF THE 28Si LATTICE PARAMETER E. Massa, G. Mana and E.G. Kessler ¹Istituto Nazionale di Ricerca Metrologica (INRIM), Italy ²National Institute of Standards and Technology (NIST), USA</p>	<p>[TuC2-4] EVALUATION OF FLICKER MEASUREMENT UNCERTAINTIES BY A MONTE CARLO METHOD C. Matthews¹, P. Clarkson¹, P. M. Harris¹, W. G. Kürten Ihlenfeld², and P. S. Wright¹ ¹National Physical Laboratory (NPL), UK ²Physikalisch-Technische Bundesanstalt (PTB), Germany</p>



Room 109+110+111
Poster Session I
15:30 ~ 18:00

Voltage 1 Chair: Stephanie Solve (BIPM, France)	
TuP-1	<p>PRECISION MEASUREMENT FOR PROGRAMMABLE JOSEPHSON VOLTAGE STANDARD Honghui Li, Yuan Gao, and Zengmin Wang National Institute of Metrology (NIM), China</p>
TuP-2	<p>BINARY-DIVIDED ARRAYS WITH INTRINSICALLY OVERDAMPED Nb/Al-AIO_x/Nb (SNIS) JUNCTIONS DRIVEN AT 70 GHz Vincenzo Lacquaniti¹, Natascia De Leo¹, Matteo Fretto¹, Andrea Sosso¹, Franz Mueller², and Johannes Kohlmann² ¹Istituto Nazionale di Ricerche Metrologica (INRIM), Italy ²Physikalisch-Technische Bundesanstalt (PTB), Germany</p>
TuP-3	<p>JOSEPHSON-VOLTAGE-STANDARD-LOCKED SINE WAVE SYNTHESIZER: IMPLEMENTATION AND PRELIMINARY RESULTS A. Rüfenacht, F. Overney, A. Mortara, and B. Jeanneret Federal Office of Metrology (METAS), Switzerland</p>
TuP-4	<p>DOUBLE JOSEPHSON WAVEFORM SYNTHESIZER FOR HIGH PRECISION AC-DC TRANSFER MEASUREMENT S. Djordjevic¹, O. Seron¹, R. Behr², and L. Palafox² ¹Laboratoire National de Metrologie et d'Essais (LNE), France ²Physikalisch-Technische Bundesanstalt (PTB), Germany</p>
TuP-5	<p>INVESTIGATION OF AC VOLTAGE MEASUREMENT REQUIREMENTS FOR AN OSCILLATORY DYNAMIC MODE VERSION OF THE WATT BALANCE L. A. Christian, T. J. Stewart, and C. M. Sutton Measurement Standards Laboratory of New Zealand (MSL), New Zealand</p>

Voltage 2 Chair: Karl-Erik Rydler (SP Technical Research Institute of Sweden, Sweden)	
TuP-6	<p>12K OPERATION OF 2 V JOSEPHSON VOLTAGE STANDARD CIRCUIT USING NbN/TiN/NbN JUNCTIONS H. Yamamori, H. Sasaki, S. Kohjiro, and Y. Nakamura National Institute of Advanced Industrial Science and Technology (AIST), Japan</p>
TuP-7	<p>THE BIPM COMPACT JOSEPHSON VOLTAGE STANDARD S. Solve and R. Chayramy Bureau International des Poids et Mesures (BIPM), France</p>
TuP-8	<p>JOSEPHSON ARBITRARY WAVEFORM SYNTHESIZER FOR ANALYSIS OF AC COMPONENTS Oliver F. Kieler, Detlef Schleißner, Johannes Kohlmann, and Ralf Behr Physikalisch-Technische Bundesanstalt (PTB), Germany</p>
TuP-9	<p>DEVELOPMENT OF A COMPACT JOSEPHSON VOLTAGE STANDARD BASED ON NbN/TiN/NbN ARRAY OPERATING AT 12K H. Sasaki, H. Yamamori, T. Yamada, A. Shoji and S. Kohjiro National Institute of Advanced Industrial Science and Technology (AIST), Japan</p>
TuP-10	<p>MICROWAVE OPTIMIZATION OF 10 V PJVS CIRCUITS P. D. Dresselhaus, M. M. Elsbury, C. J. Burroughs, and S. P. Benz National Institute of Standard and Technology (NIST), USA</p>

Voltage 3 Chair: Murray Early (MSL, New Zealand)	
TuP-11	<p>FABRICATION OF A THIN-FILM THERMAL CONVERTER WITH RESISTIVE SENSING L. Di Lillo, L. Malatto, G. Giménez, E. Mangano, L. Fraigi, and H. Laiz Instituto Nacional de Tecnología industrial (INTI), Argentina</p>
TuP-12	<p>POWER-LAW PICTURE FOR THE INTERPOLATION OF AC-DC DIFFERENCES IN THERMAL STANDARDS F. A. Silveira, R. M. Souza, and R. P. Landim Instituto Nacional de Metrologia, Normalizacao e Qualidade Industrial (Inmetro), Brazil</p>
TuP-13	<p>CALIBRATION-FREE ARBITRARY POWER CALIBRATOR WITH SELF-CALIBRATION BY AC-DC MEASUREMENT TECHNIQUES T. Yamada¹, S. Kon¹, S. Hayashi¹, H. Fujiki¹, Y. Amagai¹, Y. Nakamura¹, H. Sasaki², E. Ogita³, and T. Kawakami³ ¹National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (NMIJ-AIST), Japan ²National Institute of Advanced Industrial Science and Technology (AIST), Japan ³Yokogawa Electric Corporation, Japan</p>
TuP-14	<p>EVALUATION OF THE TRANSFER ERRORS OF SINGLE JUNCTION THERMAL VOLTAGE CONVERTER (SJTVC) VIA ELECTRICAL SIMULATION Mamdouh Halawa National Institute for Standards (NIS), Egypt</p>
TuP-15	<p>AUTOMATION AND EVALUATION OF TWO DIFFERENT TECHNIQUES TO CALIBRATE PRECISION CALIBRATORS FOR LF VOLTAGE & CURRENT USING THERMAL DEVICES Bijendra Pal, Saood Ahmad, A. K. Nil Govil, and P. Banerjee National Physical Laboratory (NPLI), India</p>
TuP-16	<p>LOADING EFFECT OF THE AC-DC TRANSFER STANDARD FOR LOW LEVEL AC VOLTAGE STANDARD Sung-Won Kwon, Mun-Seog Kim, K. T. Kim, and J. K. Jung Korea Research Institute of Standards and Science (KRISS), Korea</p>

Voltage 4 Chair: Samuel Benz (National Institute of Standard and Technology, USA)	
TuP-17	<p>IMPACT OF 1/f NOISE OF DVM ON JOSEPHSON VOLTAGE STANDARD COMPARISON Y. Tang¹, S. Solve² and T. J. Witt³ ¹National Institute of Standard and Technology (NIST), USA ²Bureau International des Poids et Mesures (BIPM), France ³BIPM – retired, France</p>
TuP-18	<p>INVESTIGATIONS USING AN IMPROVED JOSEPHSON ARBITRARY WAVEFORM SYNTHESIZER (JAWS) SYSTEM Detlef Schleißner, Oliver F. Kieler, Ralf Behr, Johannes Kohlmann, and Torsten Funck Physikalisch-Technische Bundesanstalt (PTB), Germany</p>
TuP-19	<p>SAMPLING MEASUREMENTS OF LOW-FREQUENCY WAVEFORMS BASED ON THE JOSEPHSON VOLTAGE STANDARD Mun-Seog Kim, Kyu-Tae Kim, Wan-Seop Kim, Yonuk Chong, and Sung-Won Kwon Korea Research Institute of Standards and Science (KRISS), Korea</p>
TuP-20	<p>DEVELOPMENT OF A SINE WAVE SYNTHESIZER BASED ON A JOSEPHSON WAVEFORM SYNTHESIZER FOR AC-DC TRANSFER MEASUREMENTS H. Ndilimabaka, O. Séron, and S. Djordjevic Laboratoire National de Metrologie et d'Essais (LNE), France</p>
TuP-21	<p>RECONSTRUCTION OF THE COOLING SETUP OF THE JOSEPHSON VOLTAGE STANDARD SYSTEM IN CMI M. Šíra¹, J. Streit¹, M. Schubert², M. Starkloff², and G. Wende ¹Czech Metrology Institute, Czech Republic ²Supracon AG, Germany</p>



Voltage 5

Chair: Laurie Christian
(MSL, New Zealand)

TuP-22 AUTOMATIC TUNING OF THE PULSE-DRIVEN AC JOSEPHSON VOLTAGE STANDARD
Ernest Houtzager, Helko E. van den Brom, and David van Woerkom
Van Swinden Laboratorium (VSL), The Netherlands

TuP-23 UNCERTAINTIES IN THE MEASUREMENT OF AC VOLTAGE USING A PROGRAMMABLE JOSEPHSON VOLTAGE STANDARD AND A PHASE SENSITIVE NULL DETECTOR
D. Georgakopoulos
National Measurement Institute, Australia

TuP-24 A 10 V JOSEPHSON VOLTAGE STANDARD COMPARISON BETWEEN NIST AND INMETRO AS A LINK TO BIMP
R. P. Landim¹, Y. Tang², E. Afonso¹, and V. Ferreira¹
¹Instituto Nacional de Metrologia, Normalizacao e Qualidade Industrial (Inmetro), Brazil
²National Institute of Standards and Technology (NIST), USA

TuP-25 INDUCTANCE MEASUREMENTS OF JOSEPHSON ARRAYS
A. Katkov¹ and R. Behr²
¹D.I. Mendeleev Institute for Metrology (VNIIM), Russian Federation
²Physikalisch-Technische Bundesanstalt (PTB), Germany

TuP-26 A WAY FOR INCREASING THE ACCURACY OF AN AC-PJVS
A. Katkov¹, R. Behr², and L. Palafox²
¹D.I. Mendeleev Institute for Metrology (VNIIM), Russian Federation
²Physikalisch-Technische Bundesanstalt (PTB), Germany

Voltage 6

Chair: Peter Filipi
(NRC-CNRC, Canada)

TuP-27 DEVELOPMENT OF A PRECISION RESISTIVE VOLTAGE DIVIDER FOR FREQUENCIES UP TO 100 kHz
T. Hagen and I. Budovsky
National Measurement Institute, Australia

TuP-28 ON THE CALIBRATION OF A WIDEBAND METER
M. D. Early and J. A. M. King
Measurement Standards Laboratory, New Zealand

TuP-29 MEASURING AC QUANTITIES WITH ROTATION SYMMETRY GROUPS
K. Seki
Mitsubishi Electric Corp., Japan

TuP-30 DC PERFORMANCE OF A HIGH ACCURACY THERMAL TRANSFER STANDARD
M. D. Early¹, M. Garcocz², and L. A. Christian¹
¹Measurement Standards Laboratory, New Zealand
²Bundesamt fur Eich, Austria

TuP-31 MEASUREMENT OF ULTRA-LOW FREQUENCIES VOLTAGE BASED ON DUAL-HEATER THERMAL CONVERTER AT THE RANGE FROM 0.01HZ TO 1HZ
Xianlin Pan¹, Jiangtao Zhang², Lei Wang², Hongtao. Huang², Zuliang Lu², and Deshi. Zhang²
¹Harbin Institute of Technology, China
²National Institute of Metrology (NIM), China

TuP-32 PRECISION RMS VALUE MEASUREMENT OF NON-COHERENT SAMPLED SIGNALS
H. Hegeduš, P. Mostarac, and R. Malarić
University of Zagreb, Croatia (Hrvatska)

Voltage 7

Chair: Dennis WK Lee
(SCL, Hong Kong)

TuP-34 SYNTHESIS OF PRECISE AC VOLTAGE WITH SINUS JOSEPHSON JUNCTION ARRAYS
Zengmin Wang, Yuan Gao, and Honghui Li
National Institute of Metrology (NIM), China

TuP-35 DC VOLTAGE STANDARD BASED ON SQUARE WAVE EXCITATION OF A MICROMECHANICAL CAPACITIVE SENSOR
J. Kaasalainen and A. Manninen
Center for Metrology and Accreditation (MIKES), Finland

TuP-36 LONG TERM BEHAVIOR OF A MULTI-ZENER 10 V VOLTAGE STANDARD
Daniel Slomovitz, Leonardo Trigo, and Heriguatí de Souza
La energia de todos (UTE), Uruguay

TuP-37 ON THE UNCERTAINTIES OF MEASUREMENTS INTERNATIONAL 8001A EXTENDER
M. Šíra¹, J. Streit¹, R. Honig², and V. Nováková Zachovalová¹
¹Czech Metrology Institute, Czech Republic
²MI-Europe, Measurements International, Czech Republic

Voltage 8

Chair: Kyu-Tae Kim
(KRISS, Korea)

TuP-38 JOSEPHSON-BASED TEST BENCH FOR AC CHARACTERIZATION OF ANALOG-TO-DIGITAL CONVERTERS
F. Overney, A. Rufenacht, J.-P. Braun, and B. Jeanneret
Federal Office of Metrology (METAS), Switzerland

TuP-39 ENHANCEMENTS OF NMC'S JOSEPHSON ARRAY VOLTAGE STANDARD SYSTEM
Yinzhu Zhou, Sze Wey Chua, and Jinni Lee
National Metrology Centre, A*STAR, Singapore

TuP-40 10 V MEASUREMENTS WITH 1V-JVS USING A RESISTIVE VOLTAGE DIVIDER
M. Real, A. Tonina, M. Bierzychudek, and R. Iuzzolino
Instituto Nacional de Tecnologia Industrial, Argentina

TuP-41 DETERMINATION OF TRANSITION ERROR CORRECTIONS FOR LOW FREQUENCY STEPWISE-APPROXIMATED JOSEPHSON SINE WAVES
Gunnar Eklund, Tobias Bergsten, Valter Tarasso, and Karl-Erik Rydler
SP Technical Research Institute of Sweden, Sweden

TuP-42 A PULSE-DRIVEN JOSEPHSON ARBITRARY WAVEFORM SYNTHESIS SYSTEM AS A QUANTUM AC VOLTAGE STANDARD IN KRISS
Yonuk Chong, Woon Song, Jung-Suk Choi, Mun-Seog Kim, Wan-Seop Kim, Kyu-Tae Kim, and Se Il Park
Korea Research Institute of Standards and Science (KRISS), Korea

Power 1

Chair: Efim Shapiro
(VNIIM, Russian Federation)

TuP-43 A MEASUREMENT SYSTEM FOR POWER QUALITY TESTS OF ELECTRICAL TRAINS
S. Svensson
SP Technical Research Institute of Sweden, Sweden

TuP-44 COMPARISON OF ASYNCHRONOUS SAMPLING CORRECTION ALGORITHMS FOR POWER QUALITY MEASUREMENTS UNDER REALISTIC CONDITIONS
Rado Lapuh¹, P. Clarkson², U. Pogliano³, P. S. Wright², and J. Hällström⁴
¹MIRS/Slovenian Institute of Quality and Metrology (SIQ), Slovenia
²National Physical Laboratory (NPL), UK
³Istituto Nazionale di Ricerche Metrologica (INRIM), Italy
⁴Centre for Metrology and Accreditation (MIKES), Finland

TuP-45 PHASE COMPARISON OF HIGH CURRENT SHUNTS UP TO 100 kHz
G. C. Bosco¹, M. Garcocz², K. Lind³, U. Pogliano¹, G. Rietveld⁴, V. Tarasso⁵, B. Voljč⁶, and V. N. Zachovalová⁷
¹Istituto Nazionale di Ricerca Metrologia (INRIM), Italy
²Bundesamt fur Eich and Vermessungswesen, Austria
³Justervesenet-Norwegian Metrology Service, Norway
⁴The National Metrology Institute of The Netherlands (VSL)
⁵Swedish National Testing and Research Institute, Sweden
⁶Slovenian Institute of Quality and Metrology (SIQ), Slovenia
⁷Český Metrologický Institut (CMI), Czech Republic



TuP-46 A SURVEY OF CURRENT SHUNTS FOR AC POWER MEASUREMENTS
 V. Tarasso¹, V. N. Zachovalová², M. Garcocz³, K. Lind⁴, T. Mansten⁵, U. Pogliano⁶, G. Rietveld⁷, and B. Voljc⁸
¹SP Swedish National Testing and Research Institute, Sweden
²Cesky Metrologicky Institut (CMI), Czech Republic
³Bundesamt für Eich und Vermessungswesen (BEV), Austria
⁴Justervesenet-Norwegian Metrology Service (JV), Norway
⁵Center for Metrology and Accreditation (MIKES), Finland
⁶Istituto Nazionale di Ricerca Metrologia (INRIM), Italy
⁷Van Swinden Laboratorium (VLS), The Netherlands
⁸Slovenian Institute of Quality and Metrology (SIQ), Slovenia

TuP-47 PROGRESS IN THE DEVELOPMENT OF LOW-FREQUENCY QUANTUM-BASED AC POWER STANDARD AT NRC CANADA
 Branislav Djokic
 National Research Council of Canada (NRC), Canada

Power 2

Chair: Hector Laiz (INTI, Argentina)

TuP-48 COMPARATOR OFFSET ERROR SUPPRESSION IN STOCHASTIC CONVERTERS USED IN A WATT-HOUR METER
 Dragan Pejić¹, Marjan Urekar¹, Vladimir Vujčić¹, and Svetlana Avramov-Zamurović²
¹Faculty of Technical Sciences, Serbia
²United States Naval Academy, USA

TuP-49 DUAL TRANSFORMER FOR POWER MEASUREMENT IN THE AUDIO FREQUENCY BAND
 U. Pogliano, B. Trinchera, G. C. Bosco, and D. Serazio
 Istituto Nazionale di Ricerca Metrologica (INRIM), Italy

TuP-50 EVALUATIONS OF A WIDEBAND INDUCTIVE VOLTAGE DIVIDER AND NON-SINUSOIDAL POWER MEASUREMENT SYSTEM

T. Yamada, S. Kon, and N. Sakamoto
 National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (NMIJ-AIST), Japan

TuP-51 BAYESIAN ESTIMATION OF AMPLITUDE-MODULATED SIGNAL PARAMETERS FROM DIGITAL SAMPLING DATA
 G.A. Kyriazis
 Instituto Nacional de Metrologia, Brazil

TuP-52 BAYESIAN ESTIMATION OF INTERHARMONIC AND FLUCTUATING HARMONIC PARAMETERS FROM DIGITAL SAMPLING DATA
 G.A. Kyriazis
 Instituto Nacional de Metrologia, Brazil

TuP-53 DEVELOPMENT OF AN ETHERNET ENABLED DIGITIZER FOR ON-SITE AC MEASUREMENTS
 P. S. Wright and P. Clarkson
 National Physical Laboratory (NPL), UK

TuP-54 CHARACTERIZATION OF A WIDEBAND DIGITIZER FOR POWER MEASUREMENTS UP TO 1 MHZ
 G. Rietveld¹, C. Kramer², E. Houtzager¹, O. Kristensen², D. Zhao¹, C. de Lefte^{2,3}, and T. Lippert²
¹Van Swinden Laboratorium (VSL), The Netherlands
²Trescal A/S, Denmark
³Universite de Savoie-Polytech'Savoie, France

Power 3

Chair: Gert Rietveld (VSL, The Netherlands)

TuP-55 TET-WATT - AN AC POWER STANDARD BASED ON CLASS-D TOPOLOGIES USING ZEPOC-CODING
 J. Wellmann¹, M. Kahmann², and W. Mathis¹
¹University of Hanover, Germany
²Physikalisch-Technische Bundesanstalt (PTB), Germany

TuP-56 COMPARISON OF TWO ALGORITHMS FOR ACCURATE HARMONIC ANALYSIS OF PERIODIC ARBITRARY SIGNALS USING NONSYNCHRONOUS DIGITAL SAMPLING
 G. A. Kyriazis
 Instituto Nacional Metrology, Brazil

TuP-57 THE EMRP PROJECT METROLOGY FOR ENERGY HARVESTING
 J. Melcher¹, M. Cain², A. Bounouh³, A. Cuenat², A. Jacquot⁴, A. Manninen⁵, M. Heinonen⁵, B. Schumacher¹, F. Edler¹, J. Rees², M. Jaegle⁴, M. Zucca⁶, P. Klapetek⁷, R. Lapuh⁸, and T. Funck¹
¹Physikalisch Technische Bundesanstalt (PTB), Germany
²National Physical Laboratory (NPL), UK
³Laboratoire National de metrologie et d'Essais (LNE), France
⁴Fraunhofer-Institut für Physikalische Messtechnik (IPM), Germany
⁵Center for Metrology and Accreditation (MIKES), Finland
⁶Istituto Nazionale di Ricerche Metrologica (INRIM), Italy
⁷Cesky Metrologicky Institut (CMI), Czech Republic
⁸Slovenian Institute of Quality and Metrology (SIQ), Slovenia

TuP-58 A PROPOSED TEST PROTOCOL TO EVALUATE THE PERFORMANCE CHARACTERISTICS OF HARMONIC POWER ANALYZERS
 Zuliang Lu¹, Lei Wang¹, Zhongwen Zhu², Lijuan Liu¹, Shaoyuan Zhou², and Eddy So³
¹National Institute of Metrology (NIM), China
²Metrology Institute of Zhejiang Province, China
³National Research Council of Canada (NRC), Canada

TuP-59 RECONSTRUCTION OF BANDLIMITED SIGNAL USING SAMPLES OBTAINED FROM INTEGRATION DIGITAL VOLTMETERS
 G. B. Gubler
 D. I. Mendeleev Institute for Metrology (VNIIM), Russian Federation

TuP-60 PRECISION MEASUREMENT SYSTEM FOR CHARACTERISATION OF PHASE DISPLACEMENT OF VOLTAGE DIVIDERS UP TO 1 MHZ
 Tobias Bergsten, Valter Tarasso, and Karl-Erik Rydler
 SP Technical Research Institute of Sweden, Sweden

TuP-61 CALIBRATION METHOD FOR DIGITAL ENERGY METERS IN DIGITAL SUBSTATIONS
 Hongtao Huang¹, Lei Wang^{1,2}, Jiangtao Zhang¹, Xianlin PAN², Zuliang LU¹
¹National Institute of Metrology (NIM), China
²Harbin Institute of Technology, China

TuP-62 A NEW FLICKER TEST STANDARD BASED ON ASYNCHRONOUS SAMPLING TECHNOLOGY AND COMPENSATION ALGORITHM
 Lei Wang^{1,2}, Zeng Shufan³, Zhang Jiangtao², Liu Lijuan², Zhou Hao², Li Min², Lu Zuliang², and Zhou Shaoyuan⁴
¹Harbin Institute of Technology, China
²National Institute of Metrology, China
³Yunnan Institute of Metrology, China
⁴Zhejiang Institute of Metrology, China

Power 4

Chair: Jari Hallstrom (CMA, Finland)

TuP-63 A NEW SIMPLIFIED APPROACH TO THE ERROR ANALYSIS OF DIGITALLY SYNTHESIZED SIGNALS GENERATED BY DIGITAL-TO-ANALOG CONVERTERS AND ITS FUNDAMENTAL COMPONENT MEASUREMENT WITHOUT A FILTER
 Lu Zuliang¹, Huang Lu¹, Yang Yan¹, Wang Lei¹, and Eddy So²
¹National Institute of Metrology (NIM), China
²National Research Council of Canada (NRC), Canada

TuP-64 A COMPARISON BETWEEN NIM CHINA AND NRC CANADA SYSTEMS TO EVALUATE PERFORMANCE CHARACTERISTICS OF HARMONIC POWER ANALYZERS
 Lei Wang¹, Rejean Arseneau², Zuliang Lu¹, and Dr. Eddy So²
¹National Institute of Metrology (NIM), China
²National Research Council of Canada (NRC), Canada

TuP-65 REFERENCE STANDARD FOR HARMONICS AND NONSINUSOIDAL POWER MEASUREMENTS
 W.M.S. Wijesinghe and Young Tae Park
 Korea Research Institute of Standards and Science (KRISS), Korea

TuP-66 A PROPOSAL FOR VERIFYING THE PERFORMANCE SPECIFICATIONS OF CERTAIN FUNCTIONS OF SMART METERS IN DISTRIBUTION POWER LINE NETWORKS
 Zuliang Lu¹ and Eddy So²
¹National Institute of Metrology (NIM), China
²National Research Council of Canada (NRC), Canada



TuP-67 DC CHARACTERISATION OF AC CURRENT SHUNTS FOR WIDEBAND POWER APPLICATIONS
G. Rietveld, J. H. N. van der Beek, and E. Houtzager
The National Metrology Institute of The Netherlands (VSL), The Netherlands

TuP-68 THE ESTABLISHMENT OF POWER/ENERGY STANDARD AT CHINA ELECTRIC POWER RESEARCH INSTITUTE AND ITS COMPARISON WITH NRC
Jingfen Bai¹, Lin Yang¹, Sha Zhao¹, Jianhua Zong¹, and Eddy So²
¹China Electric Power Research Institute, China
²Natinal Research Council of Canada (NRC), Canada

TuP-69 COMPARING AND ANALYSIS OF GROUND RESISTANCE MEASUREMENT METHOD BY IEEE STD81.2 AND IEC60364 GUIDANCES
Woon-Ki Han, Jin-Soo Jeong, Seong-Su Shin, Joong-Soo Choi, and Jae-Cheol Kim
Soongsil University, Korea

Device & Material 1

Chair: Massimo Pasquale
(INRIM, Italy)

TuP-70 A Si-BASED Al/AIN/Si MIS DEEVICE AND ITS PHOTO RESPONSIVITY
Ming Chang Shih, Hsuan Yang Lin, Jia We Tan, Cheng Sen Chen, and Shih Wei Feng
National University of Kaohsiung, Taiwan

TuP-71 THE BALANCE SYSTEM OF JOULE BALANCE IN NIM
C. Li^{1,2}, Q. He², Z. Zhang², Z. Li², and B. Han³
¹Tshinghua University, China
²National Institute of Metrology (NIM), China
³Hebei University, China

TuP-72 FABRICATION AND ELECTRICAL CHARACTERIZATION OF EXFOLIATED GRAPHENE BASED DEVICES
J. Guignard¹, O. Couturaud¹, S. Ducourtieux¹, F. Schopfer¹, W. Poirier¹, and D. C. Glattli²
¹Laboratoire National de metrologie et d'Essais (LNE), France
²CEA Saday, France

TuP-73 EXPERIMENTAL INVESTIGATION OF WHISPERING-GALLERY-MODE DIELECTRIC RESONATORS FOR BIOLOGICAL MATERIAL CHARACTERIZATION
Mohamed S. Kheir¹, Hany F. Hammad¹, and Abbas Omar²
¹German University in Cairo, Egypt
²University of Magdeburg, Germany

TuP-74 STUDY ON THE MAGNETIC PROPERTIES OF AUGENI OHMIC CONTACTS TO GAASALGAAS HTEROSTRUCTURES
Y. Zhong¹, Q. Zhong¹, Q. He¹, Y. F. Lu¹, J. T. Zhao¹, Z. K. Li¹, Z. H. Zhang¹, and Z. T. Chi²
¹National Institute of Metrology (NIM), China
²Qing Dao University, China

TuP-75 BEHAVIOR OF PERMITTIVITY AND LOSS TANGENT FOR A CLASS OF LOW-LOSS MATERIALS
James Baker-Jarvis, Michael D. Janezic, Bill Riddle, and Sung Kim
National Institute of Standards and Technology (NIST), USA

TuP-76 PROPERTIES OF SHUNT-PROTECTED TUNNELING DEVICES FOR THE ELECTRON COUNTING CAPACITANCE STANDARD (ECCS) EXPERIMENT AT PTB
Benedetta Camarota, Sergey V. Lotkhov, Hansjoerg Scherer, Thomas Weimann, Peter Hinze, and Alexander Zorin
Physikalisch-Technische Bundesanstalt (PTB), Germany

Device & Material 2

Chair: Luciano Brunetti
(INRIM, Italy)

TuP-77 CHARACTERIZATION OF EPITAXIAL GRAPHENE STRUCTURES
S. Novikov¹, A. Satrapinski², and N. Lebedeva¹
¹Aalto University, Finland
²Center for Metrology and Accreditation MIKES, Finland

TuP-78 EVALUATION FOR DIELECTRIC PROPERTY OF HEAT TRANSFER FLUIDS USING NEWLY DESIGNED CYLINDRICAL CAPACITIVE-CONDUCTIVE SYSTEM
Jae Hoon Kim¹, Ju Han Kim¹, Yoon Hyung Kim¹, Sang Ok Han¹, and Gee Joong Yong²
¹Chungnam National University, Korea
²Korea Automobile Testing & Research Institute, Korea

TuP-79 DEVELOPMENT OF DIFFERENTIAL POTENTIOMETRIC STRIPPING ANALYSIS INSTRUMENT BASED ON VIRTUAL INSTRUMENT
Jianfeng Liu¹, Baohe Yang², and Pingping Luo¹
¹Shanghai University of Electronic Power, China
²Zhengzhou Normal College, China

TuP-80 TRANSPORT PROPERTIES OF YB_{a2}Cu₃O/
La_{0.67}Sr_{0.33}MnO₃
HETEROSTRUCTURES FOR JAVS
Š. Beňačko¹, V. Štrbík¹, Š. Gaži, Š. Chromik¹, A. Dujavová¹, and P. Vrabček²
¹Institute of Electrical Engineering, Slovak Republic
²Slovak Institute of Metrology, Slovak Republic

TuP-81 CARBON NANOTUBE COATINGS AND THEIR ELECTROMAGNETIC INTERFERENCE SHIELDING EFFECTIVENESS
Ping Li¹, Yueyan Shan², Xijiang Yin¹, and Junhong Deng³
¹Advanced Materials Technology Center, Singapore
²National Metrology Center, A*STAR, Singapore
³TUV SUD PSB Pte. Ltd., Singapore

TuP-82 THEORY AND DESIGN OF WAVEFORM PURER
S. Li^{1,2}, Z. Li¹, and Z. Zhang¹
¹National Institute of Metrology, China
²Tsinghua University, China



TECHNICAL PROGRAM

June 16, 2010 (Wednesday)

Room 202
07:30 ~ 09:00 Speaker's Breakfast
Room 201
[Plenary Session 4] Squid Development at KRISS and Measurements Smart Grid and High Voltage Chair: Y. S. Song (KRISS, Korea)
09:00 ~ 09:45
[PS4-1] "LOW-NOISE SUPERCONDUCTING QUANTUM INTERFERENCE DEVICES FOR MEASURING BRAIN AND CARDIAC MAGNETIC SIGNALS" Y. K. Park, Y. H. Lee, H. Kwon, K. Kim, J. M. Kim, K. K. Yu, H. K. Lim, and I. S. Kim Korea Research Institute of Standards and Science (KRISS), Korea
09:45 ~ 10:30
[PS4-2] "THE ROLE OF AN NMI IN PROVIDING SUPPORT TO THE ELECTRICAL POWER INDUSTRY IN THE ERA OF SMART GRID" Eddy So National Research Council of Canada (NRC), Canada
Lobby (1F)
10:30 ~ 11:00 Coffee Break

June 16, 2010 (Wednesday)

Room 101+102	Room 103+104	Room 105+106
[WeA1] Magnetism I Chair: Michael Hall (NPL, UK)	[WeB1] Impedance (LF) I Chair: Jurgen Melcher (PTB, Germany)	[WeC1] Radio Frequency I Chair: Koji Komiyama (NMIJ, Japan)
11:00 ~ 12:30		
<p>[WeA1-1] ESTABLISHMENT OF THE MAGNETIC FLUX DENSITY STANDARD IN THE RANGE 100 μT TO 1000 μT Aloysius RP, Vivek Verma, Vibhav Pandey, P. Srinivasan, and R. K. Kotnala National Physical Laboratory (NPLI), India</p> <p>[WeA1-2] INTEGRATING DYNAMIC BAYESIAN NETWORKS AND CONSTRAINT-BASED FUZZY MODELS FOR MYOCARDIAL INFARCTION CLASSIFICATION WITH 12-LEAD ECGS Yi-Yuan Chiang and Wang-Hsin Hsu Vanung University, Taiwan</p> <p>[WeA1-3] AC/DC MAGNETIC FLUX DENSITY STANDARD SYSTEMS AT KRISS Po Gyu Park¹, Young Gyun Kim¹, Wan-Seop Kim¹, and Vladlen Shifrin² ¹Korea Research Institute of Standards and Science (KRISS), Korea ²D. I. Mendeleev Institute for metrology (VNIIM), Russian Federation</p> <p>[WeA1-4] STANDARD MEASURING SYSTEM FOR CALIBRATION OF MAGNETIC FLUX DENSITY GRADIOMETERS V. N. Khorev¹, V. Ya. Shifrin¹, S. A. Shubin¹, and Po Gyu Park² ¹D. I. Mendeleev Institute for Metrology (VNIIM), Russian Federation ²Korea Research Institute of Standards and Science (KRISS), Korea</p>	<p>[WeB1-1] EMBEDDED CAPACITIVE DISPLACEMENT SENSOR FOR NANOPositionING APPLICATIONS Svetlana Avramov-Zamurovic¹, Nicholas G. Dagalakis², Rae Duk Lee², Yong Sik Kim², Jae Myung Yoo², and Seung Ho Yang² ¹United States Naval Academy, USA ²National Institute of Standards and Technology (NIST), USA</p> <p>[WeB1-2] FREQUENCY DEPENDENCE OF GAS-DIELECTRIC CAPACITORS USED IN SUB-nA REFERENCE CURRENT GENERATORS S. P. Giblin¹, G. -D. Willenberg², and Nick Fletcher³ ¹National Physical Laboratory (NPL), UK ²Physikalisch-Technische Bundesanstalt (PTB), Germany ³Bureau International des Poids et Mesures (BIPM), France</p> <p>[WeB1-3] A QUANTUM IMPEDANCE STANDARD HAVING AN INSIGNIFICANT, EXPERIMENTALLY VERIFIED FREQUENCY DEPENDENCE J. Schurr¹, J. Kucera¹, K. Pierz¹, and B. P. Kibble² ¹Physikalisch-Technische Bundesanstalt (PTB), Germany ²Guest Scientist, UK</p> <p>[WeB1-4] IMPEDANCE COMPARISON AT POWER FREQUENCY BY ASYNCHRONOUS SAMPLING L. Callegaro, V. D'Elia, and E. Gasparotto Istituto Nazionale di Ricerca Metrologica (INRIM), Italy</p>	<p>[WeC1-1] DEVELOPMENT OF A 2.4 mm COAXIAL MICROCALORIMETER FOR POWER MEASUREMENTS UP TO 53 GHz M. Bourghes, D. Allal, D. Belieres, A. Kazemipour, and A. Litwin Laboratoire National de métrologie et d'Essais (LNE), France</p> <p>[WeC1-2] A NEW 50 GHz COAXIAL DC-SUBSTITUTION MICROWAVE BOLOMETER Andrew S. Brush TEGAM, Inc., USA</p> <p>[WeC1-3] PROBE RESPONSE TO A NON-UNIFORM E-FIELD IN A TEM CELL T. Morioka National Institute of Advanced Industrial Science and Technology (AIST), Japan</p> <p>[WeC1-4] A NOVEL FULL 2-PORT CALIBRATION METHOD FOR ANTENNA MEASUREMENTS USING SOL STANDARDS WITHOUT THROUGH PROCEDURE Masanobu Hirose and Koji Komiyama National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (NMIJ-AIST), Japan</p>



TECHNICAL PROGRAM

June 16, 2010 (Wednesday)

		<p>[WeC1-5] THE ELECTRODE STRUCTURE ANALYSES OF CPW ON LiTaO₃ ELECTRO-OPTICAL MODULATOR Jianwei Li^{1,2}, Nan Xu², Jian Li², Zhixin Zhang², and Limin Xiong² ¹Nankai University, China ²National Institute of Metrology (NIM), China</p>
Room 112		
12:30 ~ 14:00 Lunch		
Room 101+102	Room 103+104	Room 105+106
<p>[WeA2] Magnetism II Chair: Valdran Ya Shifrin (VNIIM, Russia)</p>	<p>[WeB2] Impedance (LF) II Chair: Wan-Seop Kim (KRISS, Korea)</p>	<p>[WeC2] Device & Material Chair: Po Gyu Park (KRISS, Korea)</p>
14:00 ~ 15:30		
<p>[WeA2-1] COMPARISON OF FERROMAGNETIC RESONANCE AND DAMPING IN PERMALLOY FILMS USING TIME AND FREQUENCY DOMAIN TECHNIQUES M. Pasquale¹, G. Bertotti¹, E. Sonia Olivetti¹, M. Coisson¹, F. Celegato¹, M. Kuepferling¹, Y. Endo², Y. Mitsuzuka², M. Yamaguchi², S. Serrano-Guisan³, H. W. Schumacher³, and P. Kabos⁴ ¹Istituto Nazionale di Ricerca Metrologica (INRIM), Italy ²Tohoku University, Japan ³Physikalisch-Technische Bundesanstalt (PTB), Germany ⁴National Institute of Standard and Technology (NIST), USA</p> <p>[WeA2-2] THE QED VACUUM MAGNETIC BIREFRINGENCE EXPERIMENT M. Fouché^{1,2}, P. Berceau³, R. Battesti³, and C. Rizzo^{1,2} ¹Université de Toulouse, France ²CNRS, France ³Laboratoire National des Champs Magnétiques Intenses (CNRS-INSA-UPS), France</p>	<p>[WeB2-1] THE INFLUENCE OF THE NETWORK IMPEDANCE ON THE NON-SINUSOIDAL (HARMONIC) NETWORK CURRENT AND FLICKER MEASUREMENTS I. Urdea-Marcus¹, A. Nestor¹, and P. Clarkson² ¹National Institute of Metrology, Romania ²National Physical Laboratory (NPL), UK</p> <p>[WeB2-2] VERIFICATION AND UNCERTAINTY EVALUATION OF AN AC SHUNT CALIBRATION SYSTEM AT POWER FREQUENCIES Saytaro Kon¹, Tatsuji Yamada¹, and Takuya Tadokoro² ¹National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (NMIJ-AIST), Japan ²Japan Electric Meters Inspection Corporation (JEMIC), Japan</p>	<p>[WeC2-1] FABRICATION AND CHARACTERIZATION OF GRAPHENE-BASED QUANTUM HALL EFFECT DEVICES AT INRIM M. Bruna, C. Cassiago, L. Callegaro, E. Gasparotto, R. Rocci, and S. Borini Istituto Nazionale di Ricerca Metrologica (INRIM), Italy</p> <p>[WeC2-2] PRELIMINARY RESULTS ON GAAS-ALGAAS HETEROSTRUCTURE QUANTUM HALL RESISTANCE STANDARD BY THE NIM Y. Zhong¹, Q. Zhong¹, Q. He¹, Y. F. Lu¹, J. T. Zhao¹, Z. K. Li¹, Z. H. Zhang¹, and Z. T. Chi² ¹National Institute of Metrology (NIM), China ²Qing Dao University, China</p>

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<p>[WeA2-3] EQUIVALENCE OF MEASUREMENTS ON SOFT MAGNETIC MATERIALS IN THE UK AND MEASUREMENTS FOR OPERATIONAL CONDITIONS Michael Hall¹, Owen Thomas¹, Harvey Smith², and Philip Anderson³ ¹National Physical Laboratory (NPL), UK ²TRW Conekt, UK ³Cardiff University, UK</p> <p>[WeA2-4] LOW TEMPERATURE MECHANICAL PROPERTIES OF A FLUX-QUANTUM FORCE DEVICE J. H. Choi¹, Y. W. Kim^{1,2}, H. H. Choi¹, J. Kim¹, and S. G. Lee² ¹Korea Research Institute of Standards and Science (KRISS), Korea ²Korea University, Korea</p>	<p>[WeB2-3] POWER SOURCE IMPEDANCE MEASUREMENT SYSTEM FOR TESTING COMPLIANCE TO IEC 61000-3-3 P. Clarkson, P. S. Wright, A. J. Wheaton, and J. H. Belliss National Physical Laboratory (NPL), UK</p> <p>[WeB2-4] PRECISION UNIVERSAL AC BRIDGES WITH PHASE CONTROLLED DIVIDERS M. Surdu¹, D. Surdu¹, and A. Koffman² ¹The State Enterprise All-Ukrainian State Research and Production Center for Standardization (SE "Ukrmettestandard"), Ukraine ²National Institute of Standard and Technology (NIST), USA</p>	<p>[WeC2-3] QUANTITATIVE PERMITTIVITY MEASUREMENTS OF NANOLITER FLUID VOLUMES FROM 50 MHz TO 40 GHz WITH MICROFLUIDIC CHANNELS J. C. Booth, N. D. Orloff, X. L. Lu, Y. Wang, E. Rocas, J. Mateu, C. Collado, and M. Janezic National Institute of Standards and Technology (NIST), USA</p> <p>[WeC2-4] NON-DESTRUCTIVE BROADBAND MATERIAL CHARACTERIZATION OVER THE K-BAND USING WHISPERING-GALLERY-MODE RESONATORS Mohamed S. Kheir¹, Hany F. Hammad¹, and Abbas Omar² ¹German University in Cairo, Egypt ²University of Magdeburg, Germany</p> <p>[WeC2-5] CAPACITANCE-BASED REAL TIME MONITORING OF RECEPTOR-MEDIATED ENDOCYTOSIS Kyung-Hwa Yoo Yonsei University, Korea</p>
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TECHNICAL PROGRAM

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Room 107		
AMTA Special Session Chair: Vince Rodriguez (ETS Lindgren, USA) and No-Weon Kang (KRISS, Korea)		
14:00 ~ 18:00		
AMTA-T1	14:00 ~ 14:55	[Tutorial 1] ANECHOIC CHAMBERS FOR EMC, APM AND RCS MEASUREMENTS Vince Rodriguez ETS-Lindgren, USA
AMTA-1	14:55 ~ 15:15	TIME-DOMAIN THREE ANTENNA METHOD FOR BICONICAL ANTENNA Satoru Kurokawa, Michitaka Ameya, and Masanobu Hirose National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (NMIJ-AIST), Japan
AMTA-2	15:15 ~ 15:35	PLANAR REACTIVE NEAR-FIELD SCANNING SYSTEM AT KRISS Dong-Joon Lee, No-Weon Kang, Jae-Yong Kwon, Joo-Gwang Lee, and Jin-Seob Kang Korea Research Institute of Standards and Science (KRISS), Korea
Lobby (1F)		
15:35 ~ 16:05 Coffee Break		
AMTA-3	16:05 ~ 16:25	COMPARISON OF NEAR-FIELD METHODS AT NIST K. MacReynolds, M. H. Francis, and D. Tamura National Institute of Standards and Technology (NIST), USA
AMTA-4	16:25 ~ 16:45	SWEPT FREQUENCY GAIN MEASUREMENTS FOR STANDARD HORN ANTENNAS Y. Ji and F. M. Warner National Measurement Institute Australia, Australia
AMTA-5	16:45 ~ 17:05	INTERCOMPARISON OF W-BAND STANDARD GAIN HORN ANTENNAS J. Kang ¹ , N. Kang ¹ , D. Gentle ² , K. MacReynolds ³ , and M. Francis ³ ¹ Korea Research Institute of Standards and Science (KRISS), Korea ² National Physical Laboratory (NPL), UK ³ National Institute of Standards and Technology (NIST), USA
AMTA-T2	17:05 ~ 18:00	[Tutorial 2] ESTIMATING MEASUREMENT UNCERTAINTIES Michael Francis National Institute of Standards and Technology (NIST), USA

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Room 109+110+111	
Poster Session II	
15:30 ~ 18:00	
Impedance (LF) 1	Impedance (LF) 2
Chair: Yasuhiro Nakamura (NMIJ, Japan)	Chair: Yicheng Wang (NIST, USA)
WeP-1 JOHNSON-NYQUIST NOISE OF THE QUANTIZED HALL RESISTANCE J. Schurr ¹ , K. Pierz ¹ , and B. P. Kibble ² ¹ Physikalisch-Technische Bundesanstalt (PTB), Germany ² Guest Scientist, UK	WeP-5 COMPARISON OF TEMPERATURE COEFFICIENT OF STANDARD INDUCTOR BY MEASURING CHANGE IN INDUCTANCE AND RESISTANCE M. A. Ansari, Jyotsana and Anil Kishore Saxena National Physical Laboratory, India
WeP-2 IMPROVEMENTS OF AC/DC CALCULABLE STANDARD RESISTOR WITH DOUBLE HELIX ARRANGEMENT AND KELVIN RESISTANCE BRIDGE AT NIM Huang Lu ¹ , Yang Yan ¹ , Wang Wei ¹ , Qu Zhengwei ² , and Li Zhengkun ¹ ¹ National Institute of Metrology (NIM), China ² Yanshan University, China	WeP-6 A FAST L-R COMPARISON SYSTEM BY DIGITAL SAMPLING MEASUREMENT APPROACH Yan Yang, Wei Wang, Lu Huang, Zuliang Lu, and Wenjun Lu National Institute of Metrology (NIM), China
WeP-3 VERIFICATION OF LCR METERS BY MEANS OF A 4TP 100 OHMS LINEARITY TEST STANDARDS AVER THE FREQUENCY RANGE 100 Hz TO 1MHz J. Nicolas ¹ , A. Van Theemsche ¹ and S. A. Awan ² ¹ DG Quality and Safety, Scientific Metrology (SMD), Belgium, ² AC Electromagnetic Metrology, UK	WeP-7 COMPARISON OF DIFFERENT METHODS OF INDUCTANCE REALISATION G. Eklund ¹ , A. Satrapinski ² , E-P. Suomalainen ² , and Yu. Semenov ³ ¹ SP Technical Research Institute of Sweden, Sweden ² Center for Metrology and Accreditation (MIKES), Finland ³ D. I. Mendeleev Institute for Metrology (VNIIM), Russian Federation
WeP-4 DEVELOPMENT OF ON-CHIP DOUBLE-SHIELDED QUANTUM HALL DEVICE FOR USE IN AC QUANTIZED HALL RESISTANCE MEASUREMENT T. Oe ¹ , K. Matsuhiro ¹ , A. Domae ¹ , C. Urano ¹ , H. Fujino ² , H. Ishii ² , T. Itatani ² , G. Sucheta ² , M. Maezawa ² , S. Kiryu ³ , and N. Kaneko ¹ ¹ National Metrology Institute of Japan, Japan ² National Institute of Advanced Industrial Science and Technology (NMIJ-AIST), Japan ³ Tokyo City University, Japan	WeP-8 SCALING OF INDUCTANCE TO THE PH-LEVEL K.-E. Rydler, V. Tarasso, and T. Bergsten SP Technical Research Institute of Sweden, Sweden
	WeP-9 EVALUATION OF 100 mH INDUCTANCE BY SERIES RESONANCE METHOD IN VNIIM AND IN MIKES Yu. Semenov ¹ and A. Satrapinski ² ¹ D. I. Mendeleev Institute for Metrology (VNIIM), Russian Federation ² Center for Metrology and Accreditation (MIKES), Finland
	WeP-10 EVALUATION OF THE LONG TERM STABILITY OF STANDARD INDUCTORS USING BAYESIAN STATISTICS G. M. Rocha Instituto Nacional de Metrologia, Normalizacao e Qualidade Industrial (Inmetro), Brazil



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Impedance (LF) 3

Chair: Wan-Seop Kim
(KRISS, Korea)

WeP-11 A NEW CAPACITANCE DEVICE FOR CALIBRATION OF N:1 HF INDUCTIVE VOLTAGE DIVIDERS

J. Kučera^{1,2}, R. Sedláček², and J. Boháček²
¹Physikalisch Technische Bundesanstalt (PTB), Germany
²Czech Technical University in Prague, Czech Republic

WeP-12 BALANCED WIDE FREQUENCY RANGE QUADRATURE PHASE SHIFTER

M. Surdu, A. Lameko, D. Surdu, and S. Kursin
The State Enterprise All-Ukrainian State Research and Production Center for Standardization (SE "Ukrmetrteststandard"), Ukraine

WeP-13 A METHOD TO CORRECT INDUCTIVE VOLTAGE DIVIDERS ERROR CAUSED BY CAPACITANCES BETWEEN WINDING AND SCREEN

Zhao Jianting, He Qing, and Lu Yunfeng
National Institute of Metrology (NIM), China

WeP-14 A FOUR TERMINAL-PAIR COAXIAL IMPEDANCE BRIDGE CONSTRUCTED AT INMETRO

Renata de Barros e Vasconcellos and Luiz Macoto Ogino
Instituto Nacional de Metrologia, Normalizacao e Qualidade Industrial (Inmetro), Brazil

WeP-15 MULTI-FREQUENCY QUADRATURE BRIDGE FOR USE IN AC QHR MEASUREMENT

A. Domae and Y. Nakamura
National Metrology Institute of Japan, National Institute of Advanced industrial Science and Technology (NMIJ-AIST), Japan

Impedance (LF) 4

Chair: Jurgen Melcher
(PTB, Germany)

WeP-16 SAMPLING BASED RLC BRIDGE

F. Overney and B. Jeanneret
Federal Office of Metrology (METAS), Switzerland

WeP-17 DDS SOURCES FOR PRECISE MEASUREMENT

Y. Fu^{1,2}, Z. Li², Z. Zhang², J. Sun¹, and L. Chen¹
¹China Jiliang University, China
²National Institute of Metrology (NIM), China

WeP-18 INTERNATIONAL COMPARISON OF IMPEDANCE STANDARDS FREQUENCY DEPENDENCE UP TO 50 MHz

J. Horsky¹, J. Horska¹, P. Horsky², and E. A. Abrosimov³
¹Czech Metrology Institute, Czech Republic
²Brno University of Technology, Czech Republic
³SNIM, Russia

WeP-19 PROGRESS IN TEST ELECTRICAL CONDUCTIVITY OF AVIATION FUEL

Lianying Zheng, Yue Liu, Honggang Zhao, Xiuzeng Zhang, Chaolai HE, and Benxia Zou
National Institute of Metrology (NIM), China

WeP-20 VERIFICATION OF PERFORMANCE OF COMMERCIAL LCR METERS

A. Pokatilov¹, A. Satrapinski², T. Kübarsepp¹, and O. Märtens³
¹Metrosert Ltd., Estonia
²Center for Metrology and Accreditation (MIKES), Finland
³Tallinn University of Technology, Estonia

Impedance (LF) 5

Chair: Zuliang Lu
(NIM, China)

WeP-21 FABRICATION AND MEASUREMENT OF ELECTRODE COMPONENTS FOR THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY CALCULABLE CAPACITOR

Jon R. Pratt, Nolan Brandenburg, John R. Stoup, Raeduk Lee, and Yicheng Wang
National Institute of Standards and Technology (NIST), USA

WeP-22 CALIBRATION METHOD FOR LARGE CAPACITANCES USING A CURRENT COMPARATOR WITH AN INDUCTIVE VOLTAGE DIVIDER

N. Sakamoto and Y. Nakamura
National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (NMIJ-AIST), Japan

WeP-23 PROPOSALS FOR LINKING THE RESULTS OF KEY COMPARISONS CCEM-K4 AND COOMET. EM-K4

O. Velychko
The State Enterprise All-Ukrainian State Research and Production Center for Standardization (SE "Ukrmetrteststandard"), Ukraine

WeP-24 APPLICATION OF CAPACITIVE DISPLACEMENT SENSOR ON JOULE BALANCE

Lu Yunfeng^{1,2}, Q. He¹, and J. Zhao¹
¹National Institute of Metrology (NIM), China
²Harbin Institute of Technology, China

WeP-25 REALIZATION OF THE NEW LNE THOMPSON-LAMPARD ELECTRODE SET

O. Thevenot¹, P. Gournay¹, L. Dupont¹, and L. Lahousse²
¹Laboratoire National de metrologie et d'Essais (LNE), France
²Ecole Nationale Supérieure d'Arts et Metiers (ENSAM), France

Impedance (LF) 6

Chair: Yasuhiro Nakamura
(NMIJ, Japan)

WeP-26 COAXIAL MULTIPLEXER FOR HIGH ACCURACY CAPACITANCE MEASUREMENTS

F. Overney, D. Corminboeuf, and E. Moll
Federal Office of Metrology (METAS), Switzerland

WeP-27 HIGH-VALUE CAPACITANCE MEASUREMENT BASED ON INDUCTIVE SHUNT

Dai DongXue, He XiaoBing, and Wang Wei
National Institute of Metrology (NIM), China

WeP-28 MONITORING OF NMIJ STANDARD CAPACITORS DURING THE LAST 10 YEARS

A. Domae, N. Sakamoto and Y. Nakamura
National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (NMIJ-AIST), Japan

WeP-29 REALIZATION OF DISSIPATION FACTOR STANDARD

M. Kokalj, B. Pinter, M. Lindič, B. Voljč, Z. Svetik, and R. Lapuh
Slovenian Institute of Quality and Metrology (SIQ), Slovenia

WeP-30 REFINED MODEL TO CALCULATE THE FREQUENCY DEPENDENCE OF AIR CAPACITORS FOR FREQUENCIES FROM 20 kHz TO 1 MHz

M. Homklintian^{1,2,3}, H. Bothe², T. Funck², J. Melcher², and M. Schilling³
¹National Institute of Metrology, Thailand
²Physikalisch-Technische Bundesanstalt (PTB), Germany
³Technical University Braunschweig, Germany

WeP-31 IMPROVE SMALL CAPACITANCE MEASUREMENT SENSITIVITY BY OPTO-ELECTRONIC ISOLATION METHOD

Wei Wang¹, Lu Huang¹, Yan Yang¹, Dongxue Dai¹, Qian Sun², and Lijiao Xia²
¹National Institute of Metrology (NIM), China
²Ministry of Industry and Information Technology, China

Time & Frequency 1

Chair: Feng-Lei Hong
(AIST, Japan)

WeP-32 IMPROVEMENT OF SHORT-TERM STABILITY OF PULSED OPTICALLY PUMPED RUBIDIUM ATOMIC CLOCK

I. H. Choi^{1,2}, S. B. Lee¹, T. Y. Kwon¹, and S. E. Park¹
¹Korea Research Institute of Standards and Science (KRISS), Korea
²Korea Advanced Institute of Science and Technology (KAIST), Korea

WeP-33 TRACEABLE TIME COMPARISONS BETWEEN PRECISE TIME PROTOCOL DEVICES

Te-Kwei Wang^{1,2}, Fan-Ren Chang³, and Shinn-Yan Lin⁴
¹National Taiwan University, Taiwan
²Ming Chi University of Technology, Taiwan
³National Taiwan University, Taiwan
⁴Telecommunication Laboratories Chunghwa Telecom Co., Ltd., Taiwan

WeP-34 PRECISE SAGNAC-EFFECT CORRECTION ON TWO-WAY SATELLITE TIME TRANSFER

W. H. Tseng^{1,2}, S. Y. Lin¹, K. M. Feng², H. T. Lin¹, and C. S. Liao¹
¹Telecommunication Laboratories Chunghwa Telecom Co., Ltd., Taiwan
²National Tsing Hua University, Taiwan

WeP-35 NOVEL FREQUENCY MEASUREMENT METHOD WITH LOW SAMPLING TIME

P. Mostarac, H. Hegeduš, and R. Malarić
University of Zagreb, Croatia

WeP-36 DEVELOPMENT OF AN YB OPTICAL LATTICE CLOCK AT KRISS

D.-H. Yu, C. Y. Park, W.-K. Lee, E. B. Kim, and J. Mun
Korea Research Institute of Standard and Science (KRISS), Korea



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Time & Frequency 2

Chair: Yao Hejun
(NIM, China)

- WeP-37** FIBER-BASED FREQUENCY COMBS WITH MILLIHERTZ-LEVEL RELATIVE LINEWIDTHS FOR OPTICAL LATTICE CLOCKS
Hajime Inaba^{1,2}, Yoshiaki Nakajima^{1,2}, Kazumoto Hosaka^{1,2}, Kana Iwakuni¹, Masami Yasuda^{1,2}, Takuya Kohno^{1,2}, Daisuke Akamatsu^{1,2}, Kaoru Minoshima¹, Atsushi Onae¹, and Feng-Lei Hong^{1,2}
¹National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (NMIJ-AIST), Japan
²CREST, Japan
- WeP-38** DETECTION OF GAS COMPONENT WITH FEMTOSECOND LASER PULSE
Nan Xu, Jianwei Li, Jian Li, Zhixin Zhang, and Limin Xiong
National Institute of Metrology (NIM), China
- WeP-39** FIBER SENSING SYSTEM WITH DOUBLE BRAGG GRATING FIBRY-PEROT RESONATOR
Wen Hsuan Sheih, Wen Kui Ting, Chien Cheng Hou, Hsuan Yang Lin, Ming Chang Shih, and Shih Wei Feng
National University of Kaohsiung, Taiwan
- WeP-40** DEVELOPMENT OF A MID-INFRARED OPTICAL FREQUENCY SYNTHESIZER
M. Vainio^{1,2}, M. Siltanen¹, M. Merimaa², and L. Halonen¹
¹University of Helsinki, Finland
²Centre for Metrology and Accreditation (MIKES), Finland
- WeP-41** TOWARD THE YB/SR FREQUENCY RATIO MEASUREMENT: DEVELOPMENT OF THE SR OPTICAL LATTICE CLOCK AT NMIJ, AIST
Daisuke Akamatsu^{1,2}, Masami Yasuda^{1,2}, Takuya Kohno^{1,2}, Kazumoto Hosaka^{1,2}, Hajime Inaba^{1,2}, Yoshiaki Nakajima^{1,2,3}, and Feng-Lei Hong^{1,2}
¹National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (NMIJ-AIST), Japan
²CREST, Japan
³University of Fukui, Japan
- WeP-42** IMPROVEMENT OF THE ¹⁷¹YB OPTICAL LATTICE CLOCK AT NMIJ, AIST
Masami Yasuda^{1,2}, Takuya Kohno^{1,2}, Kazumoto Hosaka^{1,2}, Hajime Inaba^{1,2}, Yoshiaki Nakajima^{1,2,3}, Daisuke Akamatsu^{1,2}, and Feng-Lei Hong^{1,2}

¹National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (NMIJ-AIST), Japan,
²CREST, Japan
³University of Fukui, Japan

Time & Frequency 3

Chair: Luc Erard
(LNE, France)

- WeP-43** GENERATION OF NEW TIME SCALE AT ROB : COMBINATION OF CESIUM CLOCKS AND HYDROGEN MASERS
Suman Sharma and Pascale Defraigne
National Physical Laboratory, India
- WeP-44** PROTECTING SIGNAL INTEGRITY AGAINST ATOMIC CLOCK ANOMALIES ON BOARD GNSS SATELLITES
Seung-Woo Lee¹ and Jeongrae Kim²
¹Korea Research Institute of Standards and Science (KRISS), Korea
²Korea Aerospace University, Korea
- WeP-45** ACCURACY IMPROVEMENT TECHNIQUE FOR TIMING APPLICATION OF LORAN-C SIGNAL
S. H. Yang¹, C. B. Lee¹, Y. K. Lee¹, J. K. Lee¹, Y. J. Kim¹, and S. J. Lee²
¹Korea Research Institute of Standards and Science (KRISS), Korea
²Chungnam National University, Korea
- WeP-46** DEVELOPMENT OF A GPU BASED TWO-WAY TIME TRANSFER MODEM
T. Gotoh, J. Amagai, T. Hobiger, M. Fujieda, and M. Aida
National Institute of Information and Communications Technology, Japan
- WeP-47** FULLY UTILIZATION OF TWSTT NETWORK DATA BY WEIGHTED LEAST SQUARES METHOD
H. T. Lin^{1,2}, C. S. Liao^{1,2}, F. D. Chu^{1,2}, and W. H. Tseng^{1,3}
¹Telecommunication Laboratories, Taiwan
²Vanung University, Taiwan
³National Tsing Hua University, Taiwan

Time & Frequency 4

Chair: Noel Dimarcq
(SYRTE, France)

- WeP-48** FORMING A REAL-TIME TIME SCALE WITH ASIA-PACIFIC TWSTT NETWORK DATA
C. S. Liao^{1,2}, H. T. Lin^{1,2}, F. D. Chu^{1,2}, Y. J. Huang¹, K. Y. Tu², and W. H. Tseng^{1,3}
¹Telecommunication Laboratories, Taiwan
²Vanung University, Taiwan
³National Tsing Hua University, Taiwan
- WeP-49** MEASUREMENT OF Cs - BUFFER GAS COLLISIONAL FREQUENCY SHIFT USING CPT PULSED CLOCK.
O. Kozlova, R. Boudot, S. Guérandel, and E. de Clercq
Laboratoire National de métrologie et d'Essais - Systeme de References Temps-Espace (LNE-SYRTE), France
- WeP-50** A DIGITAL STANDARD TIME DISTRIBUTION ARCHITECTURE WITH ITS APPLICATIONS
P.-Y. Ting¹, F. D. Chu², and C. S. Liao²
¹National Taiwan Ocean University, Taiwan
²National Time and Frequency Standard Laboratory, Taiwan
- WeP-51** ACCUMULATION OF A CLOCK STATE POPULATION BY OPTICAL PUMPING IN A CAESIUM FOUNTAIN
S. E. Park and K. Szymaniec
National Physical Laboratory (NPL), UK
- WeP-52** RUBIDIUM ATOMIC CLOCK WITH DRIFT COMPENSATION
Leonardo Trigo and Daniel Slomovitz
La energia de todos (UTE), Uruguay
- WeP-53** DETECTION OF GPS CLOCK JUMP USING TEAGER ENERGY OPERATOR
Y. J. Heo, J. Cho, and M. B. Heo
Korea Aerospace Research Institute, Korea

Time & Frequency 5

Chair: Tetsuya Ido
(NICT, Japan)

- WeP-54** COMPACT HIGH POWER RAMAN LASER SYSTEM USING PHASE-MODULATED SIDEBANDS AMPLIFIED BY A SINGLE TAPERED AMPLIFIER
K. S. Lee^{1,2}, S. E. Park², T. Y. Kwon², S. B. Lee², and J. Kim¹
¹Myongji University, Korea
²Korea Research Institute of Standards and Science (KRISS), Korea

WeP-55 IMPROVEMENT OF THE RESIDUAL SIDEMODE SUPPRESSION RATIO OF INJECTION LOCKED DFB LASER USING WIDE-SPACED FREQUENCY COMB
Han Young Ryu, Sung Hun Lee, and Ho Suhng Suh
Korea Research Institute of Standards and Science (KRISS), Korea

WeP-56 FIBER OPTIC METROLOGY: THE TEMPERATURE INFLUENCE IN DGD MEASUREMENTS
G. Borghi, A. B. dos Santos, and J. Ferreira
National Institute of Metrology, Brazil

WeP-57 SIMULATION DESIGN AND VERIFICATION OF CO MONITORING BASED ON TUNABLE DIODE LASER ABSORPTION SPECTROSCOPY
Hong-lian Li, Yan Zhu, Fang Dong, Xiao-ting Li, and Lian-shui Zhang
Hebei University, China

WeP-58 A HIGH ACCURATE SIGNAL GENERATOR BASED ON DIRECT DIGITAL FREQUENCY SYNTHESIS
Jiang Lan^{1,2}, Zhonghua Zhang², and Zhengkun Li²
¹Tsinghua University, China
²National Institute of Metrology (NIM), China

WeP-59 TESTING LORENTZ INVARIANCE USING AN ASYMMETRIC OPTICAL RESONATOR
F. Baynes, M. Tobar, and A. Luiten
University of Western Australia, Australia

Fundamental Constant 1

Chair: Barry Wood
(NRC-CNRC, Canada)

WeP-60 EVALUATING UNCERTAINTY OF THE MEAN DIAMETER OF SILICON SPHERE BY SPHERICAL HARMONICS
Jitao Zhang¹, Yan Li¹, Xuejian Wu¹, Liqiong Zhang¹, Zhen Liu¹, and Zhiyong Luo²
¹Tsinghua University, China
²National Institute of Metrology (NIM), China

WeP-61 DEVELOPMENT OF A FOUR-CHANNEL SYSTEM FOR JOHNSON NOISE THERMOMETRY
A. Pollarolo, Jifeng Qu, H. Rogalla, P. D. Dresselhaus, and S. P. Benz
National Institute of Standards and Technology (NIST), USA



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WeP-62 PROGRESS ON THE VON KLITZING CONSTANT DETERMINATION AT LNE

P. Gournay¹, O. Thevenot¹, L. Dupont¹, L. Ludovic², and F. Piquemal¹

¹Laboratoire national de métrologie et d'essais (LNE), France

²Ecole Nationale Supérieure d'Arts et Métiers (ENSAM), France

WeP-63 COMPARATIVE SURFACE INVESTIGATIONS AT SPHERICAL SI SURFACES USING OPTICAL AND X-RAY TECHNIQUES

I. Busch¹, P. Fuchs², M. Krumrey¹, and U. Kuetgens¹

¹Physikalisch-Technische Bundesanstalt (PTB), Germany

²Federal Office of Metrology (METAS), Switzerland

WeP-64 DENSITY COMPARISON OF ISOTOPICALLY ENRICHED SILICON SINGLE CRYSTALS BY THE PRESSURE-OF-FLOTATION METHOD

A. Waseda and K. Fujii

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

WeP-65 ELECTRON COUNTING CAPACITANCE STANDARD : PROGRESS REPORT

A. Rüfenacht¹, B. Jeanneret¹, and S. V. Lotkhov²

¹Federal Office of Metrology (METAS), Switzerland

²Physikalisch-Technische Bundesanstalt (PTB), Germany

Fundamental Constant 2

Chair: Ian A. Robinson
(NPL, UK)

WeP-66 CONCEPT OF AN EXPERIMENTAL VALIDATION OF THE GAMS ANGLE INTERFEROMETERS FOR THE MEASUREMENT OF THE MOLAR PLANCK CONSTANT

L. Ferroglio^{1,2,3}, M. Jentschel¹, and J. Krempel^{1,4}

¹Institut Laue Langevine, France

²Istituto Nazionale di Ricerca Metrologica (INRIM), Italy

³Politecnico di Torino, Italy

⁴Physikalische Technische Bundesanstalt (PTB), Germany

WeP-67 PHASE-SHIFTING INTERFEROMETRY: A METHOD FOR GENERATING PHASE SHIFTING BY PRESSURE VARIATION

Zhiyong Luo and Chi chen

National Institute of Metrology (NIM), China

WeP-68 CORRELATION METHOD ERRORS IN JOHNSON NOISE THERMOMETRY

L. Callegaro¹, M. Pisani¹, M. Ortolano², V. D'Elia¹, and F. Manta^{1,2}

¹Istituto Nazionale di Ricerca Metrologica (INRIM), Italy

²Politecnico di Torino, Italy

WeP-69 ABSOLUTE REFRACTOMETRY USING HELIUM

T. Badr, S. Azouigui, J. P. Wallerand, and P. Juncar

Laboratoire Commun de Metrologie (LNE-CNAM), France

WeP-70 DEVELOPMENT OF NANONEWTON FORCE STANDARD BASED ON A TORSION PENDULUM

Sheng-jui Chen and Sheau-Shi Pan

Industrial Technology Research Institute, Taiwan

WeP-71 DEVELOPMENT OF A BROADBAND SHOT NOISE MEASUREMENT SYSTEM AT LOW-TEMPERATURE FOR NOISE THERMOMETRY

J. Park^{1,2}, M. Rehman^{1,3}, J. S. Choi¹, Z. G. Kim², S. Ryu³, W. Song¹, and Y. Chong¹

¹Korea Research Institute of Standards and Science, Korea

²Seoul National University, Korea

³Chonnam National University, Korea

Fundamental Constant 3

Chair: Jos Perenboom
(Radboud Univ., The Netherlands)

WeP-72 CHARACTERIZATION OF THE COIL DISPLACEMENT IN THE LNE AND METAS WATT BALANCE

F. Bielsa¹, A. Eichenberger², O. Gilbert¹, P. Juncar³, and G. Geneves¹

¹Laboratoire National de métrologie et d'Essais (LNE), France

²Federal Office of Metrology (METAS), Switzerland

³Institut National de Metrologie (LNE-INM/CNAM), France

WeP-73 THE NRC WATT BALANCE PROJECT

A. D. Inglis, C. A. Sanchez, and B. M. Wood

National Research Council, Canada

WeP-74 THE PROGRESS OF JOULE BALANCE IN NIM

Z. Zhang¹, Q. He¹, Z. Li¹, Y. Lu¹, J. Zhao¹, B. Han², C. Li³, S. Li³, and Y. Fu⁴

¹National Institute of Metrology (NIM), China

²Hebei University, China

³Tsinghua University, China

⁴China Jiliang University, China

WeP-75 OPTICAL ALIGNMENT TOOL FOR THE LNE AND METAS WATT BALANCE PROJECTS

O. Gilbert¹, F. Bielsa¹, P. Juncar², A. Eichenberger³, and G. Geneves¹

¹Laboratoire National de métrologie et d'Essais (LNE), France

²Institut National de Metrologie (LNE-INM/CNAM), France

³Federal Office of Metrology (METAS), Switzerland

WeP-76 THE e-MASS EURAMENT JOINT RESEARCH PROJECT: THE WATT BALANCE ROUTE TOWARDS A NEW DEFINITION OF THE KILOGRAM

G. Geneves¹, F. Villar¹, F. Bielsa¹, O. Gilbert¹,

A. Eichenberger², H. Baumann², G. D. Agostino³, S. Merlet⁴, F. Pereira dos Santos⁴, P. Pinot⁵, and P. Juncar⁵

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⁵Institut National de Metrologie (LNE-INM/CNAM), France

Magnetism 1

Chair: Michael Stock
(BIPM, France)

WeP-77 ALIGNMENT PROCEDURE USED IN THE BIPM WATT BALANCE

Estefania de Mirandés, Hao Fang, Adrien Kiss, Stéphane Solve, Michael Stock, and Alain Picard

Bureau International des Poids et Mesures (BIPM), France

WeP-78 METROLOGY OF MICROSTRUCTURED WAVEGUIDES FOR SPINTRONIC APPLICATIONS

Sang-Hyun Lim¹, T. Mitch Wallis¹, Atif Imtiaz¹, Dazhen Gu¹, Pavol Krivosik², and Pavel Kabos¹

¹National Institute of Standards and Technology (NIST), USA

²University of Colorado, USA

WeP-79 THE MAGNETIC SYSTEM OF JOULE BALANCE IN NIM

B. Han^{1,2}, Q. He², Z. Zhang², Z. Li², and C. Li³

¹Hebei University, China

²National Institute of Metrology (NIM), China

³Tsinghua University, China

Room 201+202

18:30 ~ 21:30
Awards & Banquet



Room 202		
07:30 ~ 09:00 Speaker's Breakfast		
Room 201		
[Special Session] Low Carbon, Green Growth Chair: Eddy So (National Research Council, Canada)		
09:00 ~ 9:30 [SS-1] "LOW CARBON GREEN GROWTH AND SMART GRID" Seunglll Moon Seoul National University, Korea		
09:30 ~ 10:00 [SS-2] "METROLOGY FOR SMART ELECTRICAL GRIDS" G. Rietveld ¹ , J. P. Braun ² , P. W. Wright ³ , and U. Grottker ⁴ ¹ Van Swinden Laboratorium (VSL), The Netherlands ² Federal Office of Metrology (METAS), Switzerland ³ National Physical Laboratory (NPL), UK ⁴ Physikalisch-Technische Bundesanstalt (PTB), Germany		
10:00 ~ 10:30 [SS-3] "NIST COORDINATION OF SMART GRID INTEROPERABILITY STANDARDS" D. A. Wollman, G. J. FitzPatrick, P. A. Boynton, and T. L. Nelson National Institute of Standards and Technology (NIST), USA		
Lobby (1F)		
10:30 ~ 11:00 Coffee Break		
Room 101+102	Room 103+104	Room 105+106
[ThA1] High Voltage/High Current I Chair: Jari Hallstrom (CMA, Finland)	[ThB1] Impedance (LF) III Chair: Yicheng Wang (NIST, USA)	[ThC1] Radio Frequency II Chair: Nick Ridler (NPL, UK)
11:00 ~ 12:30		

<p>[ThA1-1] A TWO-CHANNEL CURRENT MEASURING SYSTEM FOR MEASURING LEAKAGE CURRENT IN HIGH DIRECT VOLTAGE MEASUREMENTS T. R. McComb NRC Institute for National Measurement Standards (INMS-NRC-CNRC), Canada</p> <p>[ThA1-2] DC HIGH CURRENT RATIO STANDARD BASED ON SERIES-PARALLEL CALIBRATION METHOD Haiming Shao^{1,2}, Feipeng Lin², Xiaoxin Hua², Bo Liang², Kaifeng Qu², and Yang Pan² ¹Tianjin University, China ²National Institute of Metrology (NIM), China</p> <p>[ThA1-3] CALIBRATION OF ROGOWSKI COILS AT HIGH CURRENTS Karel Draxler¹ and Renata Styblikova² ¹Czech Technical University in Prague, Czech Republic ²Czech Metrology Institute, Czech Republic</p> <p>[ThA1-4] THE EFFECT OF INTERFERING FLUX ON DIRECT CURRENT COMPARATOR Haiming Shao^{1,2}, Kaifeng Qu³, Yang Pan², Feipeng Lin², and Bo Liang² ¹Tianjin University, China ²National Institute of Metrology, China ³Tsinghua University, China</p> <p>[ThA1-5] TO WHAT EXTENT CAN ROGOWSKI COIL CURRENT AMPLITUDELINEARITY BE VERIFIED? B. V. Djokic¹, J. D. Ramboz², and D. E. Destefan³ ¹National Research Council of Canada, Canada ²RAMTech Engineering, USA ³Fluke Corporation, USA</p>	<p>[ThB1-1] FABRICATION OF THE MAIN ELECTRODES OF THE NMIA-BIPM CALCULABLE CAPACITOR G. W. Small National Measurement Institute, Australia</p> <p>[ThB1-2] DESIGN OF THE MEW LNE CALCULABLE CAPACITOR P. Gournay¹, O. Thevenot¹, L. Dupont¹, and L. Lahousse² ¹Laboratoire national de métrologie et d'essais (LNE), France ²Ecole Nationale Supérieure d'Arts et Métiers (ENSAM), France</p> <p>[ThB1-3] A COMPENSATION METHOD TO MEASURE THE MUTUAL INDUCTANCE AT LOW FREQUENCY Z. Li¹, Z. Zhang¹, Q. He¹, Y. Fu², J. Zhao^{1,3}, S. Li⁴, Y. Lu¹, and C. Li⁴ ¹National Institute of Metrology (NIM), China ²China Jiliang University, China ³Hebei University, China ⁴Tsinghua University, China</p> <p>[ThB1-4] IMPROVEMENT ON PRIMARY STANDARD OF DISSIPATION FACTOR AT NIM Xiaobing He and Dongxue Dai National Institute of Metrology (NIM), China</p>	<p>[ThC1-1] COMPARISON OF EXPERIMENTAL TECHNIQUES FOR EVALUATING THE CORRECTION FACTOR OF A RECTANGULAR WAVEGUIDE MICROCALORIMETER Xiaohai Cui^{1,2} and T. P. Crowley¹ ¹National Institute of Standards and Technology (NIST), USA ²National Institute of Metrology (NIM), China</p> <p>[ThC1-2] CALIBRATING E-FIELD PROBES WITH A TAPERED CELL W. t. Shay^{1,2}, W. P. hong¹, and R. R. Lao^{1,2} ¹Industrial Technology Research Institute, Taiwan ²National Chiao Tung University, Taiwan</p> <p>[ThC1-3] SIMULATOR FOR AMPLIFIER AND TRANSISTOR NOISE-PARAMETER MEASUREMENTS James Randa University of Colorado, USA</p> <p>[ThC1-4] A NEW METHOD TO IMPROVE ACCURACY OF TRANSFER TYPE POWER SENSOR CALIBRATIONS T. Zhang National Measurement Institute, Australia</p> <p>[ThC1-5] DEVELOPMENT OF A 3.5-MM COAXIAL MICROCALORIMETER FOR RF AND MICROWAVE POWER STANDARDS AT KRIS Jae-Yong Kwon, Tae-Weon Kang, Jeong Hwan Kim, and Jin-Seob Kang Korea Research Institute of Standards and Science (KRIS), Korea</p>
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TECHNICAL PROGRAM

June 17, 2010 (Thursday)

Room 112		
12:30 ~ 14:00 Lunch		
Room 101+102	Room 103+104	Room 105+106
[ThA2] High Voltage/High Current II Chair: Terry McComb (NRC, Canada)	[ThB2] Resistance I Chair: Randolph Elmquist (NIST, USA)	[ThC2] Radio Frequency III Chair: Jeong Hwan Kim (NPL, UK)
14:00 ~ 15:30		
<p>[ThA2-1] A CURRENT-COMPANY-BASED SYSTEM FOR CALIBRATING HIGH VOLTAGE CONVENTIONAL AND NON-CONVENTIONAL CURRENT TRANSFORMERS UNDER ACTUAL OPERATING CONDITIONS OF HIGH VOLTAGE AND DISTORTED CURRENT WAVEFORMS UP TO 100 KV AND 2000 A E. So, R. Arseneau, D. Bennett, and M. Frigault National Research Council of Canada, Canada</p> <p>[ThA2-2] MEASUREMENT UNCERTAINTIES OF IMPULSE PARAMETERS DUE TO NON-IDEAL STEP RESPONSE OF HIGH VOLTAGE DIVIDERS M. Ediriweera and Y. Li National Measurement Institute, Australia</p> <p>[ThA2-3] EXPANDING OF TEST CURRENT OF CT BY EQUIVALENT MAGNETO MOTIVE FORCE METHOD UP TO 20 kA K. Takahashi Japan Electric Meters Inspection Corporation (JEMIC), Japan</p> <p>[ThA2-4] A COMPUTER-CONTROLLED SYSTEM FOR CALIBRATING HIGH VOLTAGE REVENUE METERING SYSTEMS UNDER ACTUAL OPERATING CONDITIONS OF HIGH VOLTAGE AND SINUSOIDAL/NON-SINUSOIDAL VOLTAGE AND CURRENT WAVEFORMS E. So, R. Arseneau, D. Bennett, and M. Frigault National Research Council of Canada, Canada</p>	<p>[ThB2-1] NEXT GENERATION GUARDED HAMON TRANSFER STANDARDS FOR HIGH RESISTANCE D. G. Jarrett and A. J. Dupree National Institute of Standards and Technology (NIST), USA</p> <p>[ThB2-2] SETTLING BEHAVIOR OF THE BRIDGE VOLTAGE IN RESISTANCE RATIO MEASUREMENTS WITH CRYOGENIC CURRENT COMPARATORS M. Götz, D. Drung, and E. Pesel Physikalisch-Technische Bundesanstalt (PTB), Germany</p> <p>[ThB2-3] A CURRENT COMPARATOR BRIDGE FOR THE DIRECT MEASUREMENT OF 51.6kΩ AGAINST THE QUANTISED HALL RESISTANCE N. Fletcher and R. Goebel Bureau International des Poids et Mesures (BIPM), France</p> <p>[ThB2-4] QUANTUM HALL EFFECT QUANTIZATION TESTS IN EXFOLIATED BILAYER AND MONOLAYER GRAPHENE J. Guignard¹, F. Schopfer¹, W. Poirier¹, and D. C. Glattli² ¹Laboratoire National de Métrologie et d'Essais (LNE), France, ²Service de Physique de l'Etat Condensé, France</p>	<p>[ThC2-1] MISMATCH CORRECTION IN RF ATTENUATION MEASUREMENT USING PRECISION AIRLINES A. Widarta, M. Endo, and T. Kawakami National Metrology Institute of Japan, Japan</p> <p>[ThC2-2] PRECISE MILLIMETER-WAVE DIELECTRIC MEASUREMENTS OF SINGLE CRYSTAL FERROELECTRIC MATERIALS Mohammed N. Afsar, Konstantin A. Korolev, and Zijng Li Tufts University, USA</p> <p>[ThC2-3] STUDY ON ABSOLUTE CALIBRATION METHODS FOR MIXER-BASED NVNA Yichi Zhang, Maoliu Lin, and Zhe Zhang Harbin Institute of Technology, China</p> <p>[ThC2-4] A NEW ELECTRONIC VERIFICATION METHOD FOR VECTOR NETWORK ANALYZERS R. Ginley, D. Williams, and D. Legolvan National Institute of Standards and Technology (NIST), USA</p>

June 17, 2010 (Thursday)

<p>[ThA2-5] DEVELOPMENT OF PRECISION DC HIGH VOLTAGE DIVIDERS Y. Li National Measurement Institute, Australia</p>	<p>[ThB2-5] QUANTUM HALL RESISTANCE STANDARD BASED ON GRAPHENE T. J. M. B. Janssen and A. Tzalenchuk National Physical Laboratory (NPL), UK</p>	<p>[ThC2-5] A NEW METHOD FOR MEASURING ACCURATE EQUIVALENT SOURCE REFLECTION COEFFICIENT OF THREE-PORT DEVICES K. Shimaoka National Metrology Institute of Japan (NIMJ), Japan</p>
Room 109+110+111		
Poster Session III		
15:30 ~ 18:00		
Current (DC/AC) 1 Chair: Nick Fletcher (BIPM, France)		Current (DC/AC) 2 Chair: R. K. Kotnala (NPLI, India)
<p>ThP-1 TEE CONNECTORS FOR AC-DC CURRENT SHUNTS UP TO 100 A M. Garcocz Bundesamt für Eich-und Vermessungswesen (BEV), Austria</p> <p>ThP-2 ULTIMATE ERROR DETECTION CIRCUIT FOR THE HYBRID ELECTRON TURNSTILES S. V. Lotkhov and A. B. Zorin Physikalisch-Technische Bundesanstalt (PTB), Germany</p> <p>ThP-3 LARGE EXCESSIVE CURRENT DURING THE CALIBRATION OF ELECTROMETER BY USE OF A CAPACITIVE LOW-CURRENT SOURCE Chul-Young Yi and Wan-Seop Kim Korea Research Institute of Standards and Science (KRISS), Korea</p> <p>ThP-4 A COAXIAL AC SHUNT WITH CALCULABLE AC-DC DIFFERENCE Jiangtao Zhang¹, Xianlin Pan², Hongtao Huang¹, Lei Wang¹, and Deshi Zhang¹ ¹National Institute of Metrology (NIM), China ²Harbin Institute of Technology, China</p> <p>ThP-5 MODELING OF AC/DC CURRENT SHUNTS B. Pinter, M. Lindič, B. Voljč, Z. Svetik, and R. Lapuh Slovenian Institute of Quality and Metrology (SIQ), Slovenia</p>	<p>ThP-6 AC CURRENT SHUNTS FOR LARGE CURRENT AT HIGH FREQUENCY Yue Liu, Xiu-Zeng Zhang, Hong-Gang Zhao, Lian-Ying Zheng, and Ben-Xia Zou National Institute of Metrology (NIM), China</p> <p>ThP-7 CALIBRATION OF DC CURRENT UP TO 600A Hong-gang Zhao, Xiu-zeng Zhang, Yue Liu, Lian-ying Zheng, and Ben-xia Zou National Institute of Metrology (NIM), China</p> <p>ThP-8 CURRENT AND FREQUENCY RANGE EXTENSION OF AC-DC CURRENT TRANSFER DIFFERENCE MEASUREMENT SYSTEM AT CMI V. Nováková Zachovalová, M. Šíra, and J. Streit Czech Metrology Institute (CMI), Czech Republic</p> <p>ThP-9 MEASUREMENT SYSTEM FOR HIGH CURRENT SHUNTS DC CHARACTERIZATION AT CMI V. Nováková Zachovalová, M. Šíra, J. Streit, and L. Indra Czech Metrology Institute (CMI), Czech Republic</p> <p>ThP-10 DIRECT MEASUREMENT OF AC CURRENT WITH COAXIAL CURRENT SHUNTS DOWN TO 1 mA B. Voljč, M. Lindič, B. Pinter, Z. Svetik, and R. Lapuh Slovenian Institute of Quality and Metrology (SIQ), Slovenia</p>	



TECHNICAL PROGRAM

June 17, 2010 (Thursday)

June 17, 2010 (Thursday)

Resistance 1

Chair: Gerard Genevès
(LNE, France)

- ThP-11** IMPROVED DUAL JOSEPHSON VOLTAGE STANDARD POTENTIOMETER FOR HIGH PRECISION ARBITRARY RESISTANCE RATIO MEASUREMENTS
M. F. Beug, L. Palafox, and R. Behr
Physikalisch-Technische Bundesanstalt (PTB), Germany
- ThP-12** NEW DESIGNS FOR HIGH-RESISTANCE STANDARD RESISTORS
A.J. Dupree and D. G. Jarrett
National Institute of Standards and Technology (NIST), USA
- ThP-13** NOVEL 100 Ω METAL FOIL DC RESISTOR
Y. Sakamoto¹, N. Kaneko¹, T. Oe¹, M. Kumagai², and M. Zama²
¹National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (NMIJ-AIST), Japan
²Alpha Electronics Corp., Japan
- ThP-14** ON THE NIMT QUANTUM HALL RESISTANCE STANDARD
C. Kurupakorn, C. Jassadajin, and A. Charoensook
National Institute of Metrology, Thailand
- ThP-15** DEVELOPMENT OF 10-Z QUANTUM HALL ARRAY RESISTANCE STANDARDS AT NMIJ
T. Oe¹, K. Matsuhiro¹, C. Urano¹, H. Fujino¹, H. Ishii¹, T. Itatani¹, G. Sucheta¹, M. Maezawa¹, S. Kiryu², and N. Kaneko¹,
¹National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (NMIJ-AIST), Japan
²Tokyo City University, Japan
- ThP-16** QUANTUM HALL RESISTANCE STANDARDS FROM A HIGH-MOBILITY MOLECULAR BEAM EPITAXY SYSTEM
K. Pierz, M. Götz, E. Pesel, F.-J. Ahlers and H. W. Schumacher
Physikalisch-Technische Bundesanstalt (PTB), Germany

Resistance 2

Chair: Sze Wey Chua
(NMC/A*STAR, Singapore)

- ThP-17** SIMULATION OF A QUANTUM HALL CRYOGENIC CURRENT COMPARATOR RESISTANCE BRIDGE
T. B. Lawson, M. D. Early, and K. Jones
Measurement Standards Laboratory, New Zealand
- ThP-18** DESIGN CONSIDERATIONS FOR A CCC BRIDGE WITH COMPLETE DIGITAL CONTROL
J. M. Williams¹, G. Rietveld², E. Houtzager², and T. J. B. M. Janssen¹
¹National Physical Laboratory (NPL), UK
²Van Swinden Laboratorium, The Netherlands
- ThP-19** PREPARATION AND CHARACTERISATION OF EXFOLIATED GRAPHENE FOR QUANTUM RESISTANCE METROLOGY
G. Rietveld¹, H. J. van Elferen², A.J.M. Giesbers², A. Veligura⁴, U. Zeitler², K. S. Novoselov³, B. J. van Wees⁴, A. K. Geim³, and J. C. Maan²
¹Van Swinden Laboratorium, The Netherlands
²High Field Magnet Laboratory, The Netherlands
³University of Manchester, UK
⁴Rijks Universiteit Groningen, The Netherlands
- ThP-20** REALIZATION OF QUANTUM HALL RESISTANCE STANDARDS AT KRISSE BASED ON A CRYOGENIC CURRENT COMPARATOR
Wan-Seop Kim, Kwang-Min Yu, Mun-Seog Kim, Po Gyu Park, and Kyu-Tae Kim
Korea Research Institute of Standards and Science (KRISSE), Korea
- ThP-21** REALIZATION OF MAGNETIC FIELD REVERSIBLE QUANTUM HALL ARRAYS
J. Könemann, F. J. Ahlers, E. Pesel, K. Pierz, and H. W. Schumacher
Physikalisch-Technische Bundesanstalt (PTB), Germany
- ThP-22** FABRICATION AND CHARACTERIZATION OF QUANTUM HALL DEVICES FOR THE RESISTANCE STANDARD AT CMS
K. Y. Chen¹, C. F. Huang², C.-T. Liang¹, D. R. Hang³, Y. H. Chang¹, Chih-Ying Huang¹, Shih-Fang Chen², Li-Hung Lin⁴, J. C. Hsiao², Tzu-Lun Lin¹, and K. A. Cheng⁵
¹National Taiwan University, Taiwan
²Industrial Technology Research Institute, Taiwan
³National Sun Yat-sen University, Taiwan
⁴National Chiayi University, Taiwan
⁵Lung Hwa University of Science and Technology, Taiwan

Resistance 3

Chair: François Piquemal
(LNE, France)

- ThP-23** AUTOMATED HIGH-VALUE RESISTANCE CALIBRATION UP TO 1PΩ
B. Schumacher and J. Melcher
Physikalisch-Technische Bundesanstalt (PTB), Germany
- ThP-24** SYSTEM FOR RESISTANCE UNIT TRANSFER FROM 10 kΩ UP TO 100 TΩ BASED ON HAMON TRANSFERS
M. Lisowski and K. Krawczyk
Wroclaw University of Technology, Poland
- ThP-25** AccuBridge™ TOWARDS THE DEVELOPMENT OF A DC CURRENT COMPARATOR RESISTANCE RATIO STANDARD
Duane Brown, Andrew Wachowicz, and Shiping Huang
Measurements International, Canada
- ThP-26** TEMPERATURE DEPENDENCE OF Pd THIN FILM CRYO RESISTORS
A. Satrapinski¹, O. Hahtela¹, A. M. Savin², S. Novikov², and N. Lebedeva²
¹Center for Metrology and Accreditation (MIKES), Finland
²Aalto University, Finland
- ThP-27** MICROWIRE-WOUND RESISTORS IN HIGH VALUE RESISTANCE MEASUREMENTS IN VNIIM
Yu. Semenov and I. Samodurov
D.I. Mendeleev Institute for Metrology (VNIIM), Russian Federation
- ThP-28** MEASUREMENT OF RESISTANCE RATIOS WITH DIGITAL VOLTMETER AND DAQ CARD – A COMPARISON
Roman Malarić, Hrvoje Hegeduš, Igor Štambuk, and Petar Mostarac
University of Zagreb, Croatia (Hrvatska)
- ThP-29** COMPARISON OF FREQUENCY DEPENDENCES OF RESISTANCE STANDARDS MADE FROM SURFACE MOUNT RESISTORS
J. Bohacek¹, J. Horska², and R. Sedlacek¹
¹Czech Technical University, Czech Republic
²Czech Metrology Institute, Czech Republic

High Voltage / High Current 1

Chair: Terry McComb
(NRC-CNRC, Canada)

- ThP-30** STUDY ON A PASSIVE RESISTIVE FAN ATTENUATION NETWORK
Liu Na, He Xiaobing, and Wang Dahua
National Institute of Metrology (NIM), China
- ThP-31** DESIGN OF A PD MEASURING INSTRUMENT BASED ON DIGITAL OSCILLOSCOPE
Y. Hu
Istituto Nazionale di Ricerca Metrologica (INRIM), Italy, Shanghai Jiao Tong University, China
- ThP-32** UNCERTAINTY ESTIMATE OF A SPLIT-CORE ROGOWSKI COIL FOR HIGH AC CURRENT
E.-P. Suomalainen and J. Hällström
Center for Metrology and Accreditation (MIKES), Finland
- ThP-33** DEVELOPMENT OF A RC MEDIUM VOLTAGE DIVIDER FOR ON-SITE USE
G. Crotti, D. Giordano, and A. Sardi
Istituto Nazionale di Ricerca Metrologica (INRIM), Italy
- ThP-34** PHASE DISPLACEMENT CORRECTION OF REFERENCE CHANNEL IN DIGITAL BRIDGE USED FOR CALIBRATION OF INSTRUMENT TRANSFORMERS WITH DIGITAL OUTPUT
J.I. Juvik
SP National Testing and Research Institute of Sweden, Sweden
- ThP-35** SETTING-UP OF A CHARACTERIZATION SYSTEM FOR DIGITAL PD MEASURING INSTRUMENTS
Y. Hu^{1,2}, M. Chiampi³, G. Crotti¹, and A. Sardi¹
¹Istituto Nazionale di Ricerca Metrologica (INRIM), Italy
²Shanghai Jiao Tong University, China
³Politecnico di Torino, Italy

High Voltage / High Current 2

Chair: Jae Kap Jung
(KRISSE, Korea)

- ThP-36** STABILITY STUDY OF PRECISION HIGH VOLTAGE RESISTIVE DIVIDER BY AUTOMATION
Kanishk Ravat, K. B. Ravat, and Anil Kishore Saxena
Punjab University, India



TECHNICAL PROGRAM

June 17, 2010 (Thursday)

June 17, 2010 (Thursday)

ThP-37 COMPARISON OF AC CURRENT RATIO STANDARDS IN THE RANGE UP TO 4 kA
R. Styblikova¹, K. Draxler², Emil Dimitrov³, Ginka Kumanova³, and Erik Dierikx⁴
¹Czech Metrology Institute, Czech Republic
²Czech Technical University in Prague, Czech Republic
³Bulgarian Institute of Metrology, Bulgaria
⁴VSL Dutch Metrology Institute, The Netherlands

ThP-38 EVALUATION OF A MAGNETIC BRIDGE CURRENT SENSOR USING STANDARD SHUNTS
T. Yamada¹, S. Kon¹, and T. Tadatsu²
¹National Metrology Institute of Japan (NMIJ), Japan
²Japan Eco Sensor Inc., Japan

ThP-39 A HIGH-VOLTAGE REFERENCE TESTBED FOR THE EVALUATION OF HIGH-VOLTAGE DIVIDERS FOR PULSED APPLICATIONS
M. Cerqueira Bastos, M. Hammarquist, and A. Bergman
SP Technical Research Institute of Sweden, Sweden

ThP-40 METROLOGY FOR HIGH VOLTAGE DIRECT CURRENT
A. Bergman¹, U. Pogliano², J. Hällström³, P. Wright⁴, W. Lucas⁵, A. Merev⁶, G. Rietveld⁷, M. Kurrat⁸, and J. Rickmann⁹
¹SP Technical Research Institute of Sweden, Sweden
²Istituto Nazionale di Ricerche Metrologica (INRIM), Italy
³Center for Metrology and Accreditation (MIKES), Finland
⁴National Physical Laboratory (NPL), UK
⁵Physikalisch-Technische Bundesanstalt (PTB), Germany
⁶Ulusal Metroloji Enstitüsü (UME), Turkey
⁷The National Metrology Institute of The Netherlands (VSL), The Netherlands
⁸TUBS, Germany
⁹Trench, Switzerland

ThP-41 A MODIFIED TECHNIQUE FOR THE CALIBRATION OF CURRENT-COMPARATOR-BASED HIGH VOLTAGE CAPACITANCE BRIDGE AND ITS COMPARISON BETWEEN KRISS AND NRC
Agah Faisal¹, Jae Kap Jung¹, and Eddy So²
¹Korea Research Institute of Standards and Science (KRISS), Korea,
²National Research Council (NRC), Canada

High Voltage / High Current 3

Chair: Haiming Shao (NIM, China)

ThP-42 A COMPARISON OF SYSTEMS BETWEEN KRISS AND NRC TO EVALUATE PERFORMANCE CHARACTERISTICS OF A 400 KV CAPACITIVE VOLTAGE DIVIDER
Jae Kap Jung¹, Eddy So², Sang Hwa Lee¹, and David Bennett²
¹Korea Research Institute of Standards and Science (KRISS), Korea
²National Research Council (NRC), Canada

ThP-43 THE PTB INSTRUMENT TRANSFORMER BURDEN MEASUREMENT SYSTEM
E. Mohns, G. Roeissle, and W. G. Kürten Ihlenfeld
Physikalisch-Technische Bundesanstalt (PTB), Germany

ThP-44 CONSTRUCTION AND EVALUATION OF 100 kV DC HIGH VOLTAGE DIVIDER
D. Pattarakijkul, C. Kurupakorn, and A. Charoensook
National Institute of Metrology, Thailand

ThP-45 STUDY ON THE CAPACITORS OF REFERENCE PARTIAL DISCHARGE CALIBRATOR
Liu Na¹, Qian Zheng², Chen Jiawei¹, and Yin Mei²
¹National Institute of Metrology (NIM), China
²Beijing University, China

ThP-46 NEW REFERENCE MEASUREMENT SYSTEM FOR CALIBRATION OF VLF HIGH VOLTAGE
S. Bergman and A. Bergman
SP Technical Research Institute of Sweden, Sweden

High Voltage / High Current 4

Chair: Eddy So (NRC-CNRC, Canada)

ThP-47 AC VOLTAGE RATIO UNIT MOBILE SECONDARY STANDARD
Y.L. Anohin¹, V.A. Brzhezitsky², V.N. Kikalo¹, V.V. Kopshyn¹, and M.J. Mukharovsky¹
¹The State Enterprise All-Ukrainian State Research and Production Center for Standardization (SE "Ukrmetrteststandard"), Ukraine
²National Technical University of Ukraine, Ukraine

ThP-48 ESTABLISHMENT OF 40,000 A ROGOWSKI COIL CALIBRATION SYSTEM AND ITS UNCERTAINTY ANALYSIS
Yoon Hyoung Kim¹, Jae Kap Jung², Jeon Hong Kang², Sang Hwa Lee², and Sang Ok Han¹
¹Chungnam National University, Korea
²Korea Research Institute of Standards and Science (KRISS), Korea

ThP-49 EVALUATION OF COMMERCIAL CURRENT TRANSFORMER COMPARATOR BY USING PRECISE STANDARD CAPACITORS AND RESISTORS
Yoon Hyoung Kim¹, Jae Kap Jung², and Sang Ok Han¹
¹Chungnam National University, Korea
²Korea Research Institute of Standards and Science (KRISS), Korea

ThP-50 DESIGN, REALIZATION AND CHARACTERIZATION OF A HIGH CURRENT MEASUREMENT SYSTEM WITH ROGOWSKI COIL
R. Malych, O. Barczy, and P. Vrabček
Slovak Institute of Metrology (SMU), Slovakia

ThP-51 ESTIMATION FOR DEGRADATION CHARACTERISTICS OF CELLULOSE PAPER USED IN OIL-FILLED TRANSFORMER AND ANALYSIS FOR CORRELATIONSHIP USING STATISTICAL TREATMENT
Jae Hoon Kim, Doo Ki Park, and Sang Ok Han
Chungnam National University, Korea

Radio Frequency 1

Chair: Yueyan Shan (NMC/A*STAR, Singapore)

ThP-52 ERROR IN CALORIMETRIC EFFECTIVE EFFICIENCY MEASUREMENTS DUE TO DC LOSSES
T. P. Crowley and B. F. Riddle
National Institute of Standards and Technology (NIST), USA

ThP-53 A NEW INDIRECT CALIBRATION METHOD FOR EQUIVALENT SOURCE MISMATCH OF A POWER SPLITTER USING MEASUREMENT AT ONLY ONE-PORT
K. Suzuki
Agilent Technologies International Japan, Ltd., Japan

ThP-54 NON-LINEAR MODELING OF RF THERMISTOR, APPLICATION TO BOLOMETER MOUNT CALIBRATION
A. Kazemipour, F. Ziade, D. Allal, E. Bergeault, and A. Litwin
Laboratoire National de Metrologie et d'Essais (LNE), France

ThP-55 NATIONAL METROLOGY STANDARDS FOR SCATTERING PARAMETER CALIBRATION AT RADIO FREQUENCY
Masahiro Horibe, Masaaki Shida, and Koji Komiyama
National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (NMIJ-AIST), Japan

ThP-56 DIRECT EFFECTIVE EFFICIENCY MEASUREMENT FOR THERMOELECTRIC POWER SENSORS WITH TRUE-TWIN MICROCALORIMETER BY A SWITCHING METHOD
E. Vremera¹ and L. Brunetti²
¹Technical University of Iasi, Romania
²Istituto Nazionale di Ricerca Metrologica (INRIM), Italy

Radio Frequency 2

Chair: Rolf Judaschke (PTB, Germany)

ThP-57 MEASUREMENT OF ELECTRICALLY SHORT MONOPOLE ANTENNA BY THREE-ANTENNA METHOD
Masanori Ishii and Yozo Shimada
National Institute of Advanced Industrial Science and Technology (AIST), Japan

ThP-58 ANALYSIS METHODS OF COAXIAL MICROCALORIMETER DATA
L. Brunetti¹, L. Oberto¹, M. Sellone¹, and E. Vremera²
¹Istituto Nazionale di Ricerca Metrologica (INRIM), Italy
²Technical University of Iasi, Romania

ThP-59 PRACTICAL LINEARITY EVALUATION OF VECTOR NETWORK ANALYZER AT RF
M. Sanoh and K. Suzuki
Agilent Technologies International Japan, Ltd., Japan



TECHNICAL PROGRAM

June 17, 2010 (Thursday)

ThP-60 WIDEBAND TEM PARALLEL-PLATE CELL FOR SAR-PROBE CALIBRATION
A. Kazemipour, D. Allal, A. Litwin, and M. Bourghes
Laboratoire National de Metrologie et d'Essais (LNE), France

ThP-61 FINE FREQUENCY GRID CALIBRATION SETUP FOR NVNA BASED ON SQUARED CRYSTAL DETECTOR
Qinghua Xu, Maoliu Lin, and Yichi Zhang
Harbin Institute of Technology, China

Radio Frequency 3

Chair: Luciano Brunetti
(INRIM, Italy)

ThP-62 AN X-BAND MMIC SIX-PORT CORRELATOR BASED VECTOR NETWORK ANALYZER
T. Yakabe¹, K. Hirose¹, H. Matsuura¹, K. Fujii², and F. Xiao¹
¹University of Electro-Communications, Japan
²Arago Technologies, USA

ThP-63 BILATERAL COMPARISON OF 1.85 mm COAXIAL AIR LINE DIMENSIONAL AND CHARACTERISTIC IMPEDANCE MEASUREMENTS BETWEEN NPL AND NMIJ
Masahiro Horibe¹ and Nick Ridler²
¹National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (NMIJ-AIST), Japan
²National Physical Laboratory (NPL), UK

ThP-64 METROLOGY OF VECTOR MODULATION ERROR: PROBLEMS AND SOLUTION
Rui Zhang, Feng Zhou, Long-Qing Guo, and Nan Wang
China Academy of Telecommunication Research of MIIT, China

ThP-65 MEASURING AND CERTIFYING PHASE NOISE PERFORMANCE OF A LOW-NOISE RF SOURCE
Paul C. A. Roberts
Fluke Calibration, UK

ThP-66 PRECISE PERMITTIVITY AND PERMEABILITY MEASUREMENT OF ABSORBERS OVER BROADBAND MICROWAVE FREQUENCY RANGE
Anjali Sharma, Nahid Rahman, and Mohammed Afsar
Tufts University, USA

Radio Frequency 4

Chair: Kazuhiro Shimaoka
(NMIJ, Japan)

ThP-67 A METHOD FOR PRESERVING TIME-INVARIANT PHASE DETERMINATION OF OFDM SIGNAL
Zhe Zhang, Maoliu Lin, and Yichi Zhang
Harbin Institute of Technology, China

ThP-68 DIGITAL OSCILLOSCOPE CALIBRATION USING ASYNCHRONOUSLY SAMPLED SIGNAL ESTIMATION
Rado Lapuh^{1,2}, Matjaž Lindi¹, Boštjan Volj¹, Borut Pinter¹, and Zoran Svetik²
¹Slovenian Institute of Quality and Metrology, Slovenia
²Metrology Institute of the Republic of Slovenia, Slovenia

ThP-69 DESIGN AND CHARACTERIZATION OF SRD-BASED COMB GENERATOR
Maoliu Lin, Yichi Zhang, and Zhe Zhang
Harbin Institute of Technology, China

ThP-70 STUDY ON THE APPLICATION OF WIRE MESH GROUND PLANE TO AN OPEN-FIELD ANTENNA TEST SITE
Ignatius Agung Wibowo¹, Mohammad Zarar bin Mohamed Jenu¹, Alireza Kazemipour², Hafizah binti ZainoolAbidin¹, and Ahmad Fathi bin Abdul Rahim¹
¹Universiti Tun Hussein Onn Malaysia, Malaysia
²Laboratoire National de Metrologie et d'Essais (LNE), France

ThP-71 RF PEAK POWER CALIBRATION OF MODULATED SIGNALS
Joo-Gwang Lee, Jeong-Hwan Kim, Tae-Weon Kang and Sung-Ho Won
Korea Research Institute of Standards and Science (KRISS), Korea

Radio Frequency 5

Chair: Tieren Zhang
(NMIJ, Australia)

ThP-72 ABSOLUTE MEASUREMENT OF MICROWAVE POWER BASED ON THE ATOMIC RABI FREQUENCY
M. Kinoshita, K. Shimaoka, and K. Komiyama
National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (NMIJ-AIST), Japan

June 17, 2010 (Thursday)

ThP-73 BILATERAL COMPARISON BETWEEN NMC AND INRIM ON MICROWAVE POWER SENSOR USING TYPE N AND 3.5 mm CONNECTORS
Y. Shan¹, S. W. Chua¹, L. Brunetti², L. Oberto², and M. Sellone²
¹National Metrology Center (NMC), A*STAR, Singapore
²Istituto Nazionale di Ricerca Metrologica (INRIM), Italy

ThP-74 DEVELOPMENT OF A 50 GHz COAXIAL DIRECT COMPARISON TRANSFER MICROWAVE POWER SENSOR CALIBRATION SYSTEM AT NMC
Y. Shan¹, S. W. Chua¹, and Y. K. Yan²
¹National Metrology Center (NMC), A*STAR, Singapore
²Standards and Calibration Laboratory (SCL), Hong Kong

ThP-75 BRIDGING RF-VOLTAGE TO COAXIAL POWER STANDARD IN THE 100 MHz RANGE
L. Brunetti¹, M. P. Busa², L. Oberto¹, and M. Sellone¹
¹Istituto Nazionale di Ricerca Metrologica (INRIM), Italy
²Universita degli Studi di Torino, Italy

ThP-76 REALIZATION AND CHARACTERIZATION OF A WAVEGUIDE CALORIMETER FOR THE 5 TO 8.5 GHz FREQUENCY RANGE
Alain Michaud, Chantal Pevost, and David C. Paulusse
National Research Council (NRC), Canada

Radio Frequency 6

Chair: Massimo Pasquale
(INRIM, Italy)

ThP-77 EVALUATION OF A CRYOGENIC COAXIAL NOISE SOURCE BASED ON THE CALIBRATION METHOD BY SINGLE AUXILIARY TRANSMISSION LINE
H. Iida, Y. Shimada, and K. Komiyama
National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (NMIJ-AIST), Japan

ThP-78 DETERMINING NOISE TEMPERATURE OF A NOISE SOURCE USING CALIBRATED NOISE SOURCES AND AN RF ATTENUATOR
Tae-Weon Kang, Jeong-Hwan Kim, Joo-Gwang Lee, Jeong-Il Park, and Dae-Chan Kim
Korea Research Institute of Standards and Science (KRISS), Korea

ThP-79 MEASURE OF ELECTROMAGNETIC FIELD OF MOBILE PHONE MICROWAVES BY MEANS OF NARDA SRM 3000
E. Calabrò and S. Magazù
University of Messina, Italy

ThP-80 PRACTICAL EXPERIENCE IN CALIBRATION OF ESD GENERATORS
M. Borsero¹, A. Morando², A. Sardi¹, and G. Vizio¹
¹Istituto Nazionale di Ricerca Metrologica (INRIM), Italy
²Politecnico di Torino, Italy



TECHNICAL PROGRAM

June 18, 2010 (Friday)

Room 202		
07:30 ~ 09:00 Speaker's Breakfast		
Room 101+102	Room 103+104	Room 105+106
[FrA1] Current (DC/AC) II Chair: Piquemal Francois (LNE, France)	[FrB1] Resistance II Chair: Nick Fletcher (BIPM, France)	[FrC1] Radio Frequency IV Chair: Jim Randa (NIST, USA)
09:00 ~ 10:30		
<p>[FrA1-1] SAW-INDUCED CURRENT THROUGH CNT IN COULOMB BLOCKADE REGIME B. Kim^{1,2}, J.-J. Kim², M. Seo³, Y. Chung³, S. Kim¹, B.-C. Woo¹, J. Kim¹, and N. Kim¹ ¹Korea Research Institute of Standard and Science (KRISS), Korea, ²Chonbuk National University, Korea, ³Pusan National University, Korea</p> <p>[FrA1-2] CALIBRATIONS OF CURRENT-TO-VOLTAGE TRANSIMPEDANCE AMPLIFIERS USING ELECTRICAL STANDARDS Howard W. Yoon¹, George P. Eppeldauer¹, Dean G. Jarrett¹, Thomas C. Larason¹, and Wan-Seop Kim² ¹National Institute of Standards and Technology (NIST), USA ²Korea Research Institute of Standards and Science, Korea</p> <p>[FrA1-3] OPERATION OF A SILICON CMOS ELECTRON PUMP Mathieu Pierre¹, Benoit Roche¹, Xavier Jehl¹, Romain Wacquez^{1,2}, Marc Sanquer¹, Maud Vinet², Nicolas Feltin³, and Laurent Devuille³ ¹INAC, France ²LETI Institutes, France ³Laboratoire National de Metrologie et d'Essais (LNE), France</p>	<p>[FrB1-1] ULTRA-LOW NOISE CHOPPER AMPLIFIER WITH LOW INPUT CHARGE INJECTION D. Drung and J.-H. Storm Physikalisch-Technische Bundesanstalt (PTB), Germany</p> <p>[FrB1-2] NEW CRYOGENIC CURRENT COMPARATOR-BASED RESISTANCE COMPARISON BRIDGE AT LNE L. Soukiassian, G. Spengler, D. Leprat, F. Schopfer, and W. Poirier Laboratoire National de métrologie et d'Essais (LNE), France</p> <p>[FrB1-3] INTEGRATED CRYOGENIC CURRENT COMPARTOR BASED ON SUPERCONDUCTOR LSI TECHNOLOGY C. Urano¹, M. Maruyama¹, T. Oe¹, M. Maezawa¹, T. Yamada¹, M. Hidaka¹, T. Satouh¹, S. Nagasawa¹, K. Hinode¹, S. Kiryu², M. Koyanagi¹, and N. Kaneko¹ ¹National Institute of Advanced Industrial Science and Technology (AIST), Japan ²Tokyo City University, Japan</p>	<p>[FrC1-1] A MULTI-STEP APPROACH FOR ACCURATE PERMITTIVITY MEASUREMENTS OF LIQUIDS USING A TRANSMISSION LINE METHOD D. Zhao, G. Rietveld, and G. M. Teunisse The National Metrology Institute of The Netherlands (VSL), The Netherlands</p> <p>[FrC1-2] POWER SENSOR LINEARITY CALIBRATION WITH AN UNKNOWN ATTENUATOR K. Yhland, J. Stenarson, and C. Wingqvist SP Technical Research Institute of Sweden, Sweden</p> <p>[FrC1-3] ANTENNA GAIN CALIBRATION USING TIME-DOMAIN GATING IN EXTRAPOLATION RANGE FOR V-BAND PYRAMIDAL HORN ANTENNAS Michitaka Ameya, Masanobu Hirose, and Satoru Kurokawa National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (NMIJ-AIST), Japan</p>

June 18, 2010 (Friday)

<p>[FrA1-4] VIBRATING REED ELECTROMETER WITH SUB-μA CURRENT RESOLUTION Gert Rietveld The National Metrology Institute of The Netherlands (VSL), The Netherlands</p>	<p>[FrB1-4] FABRICATION OF GaAs/AlGaAs BASED QUANTUM RESISTANCE STANDARDS A. -L. Coutrot¹, A. Cavanna¹, D. Maily¹, F. Schopfer², and W. Poirier² ¹Laboratoire de Photonique et de Nanostructures (LPN), France, ²Laboratoire National de Metrologie et d'Essais (LNE), France</p>	<p>[FrC1-4] DESIGN AND MEASUREMENT OF A WR-28 CALORIMETER Xiaohai Cui¹, Xinmeng Liu¹, Yong Li¹, Hui Xu¹, and Haixia Xing² ¹National Institute of Metrology of China (NIM), China, ²Petroleum Production Technology Research Institute of Jilin Oilfield Company, China</p> <p>[FrC1-5] MEASUREMENT OF ANTENNA S-PARAMETERS AND ITS APPLICATION TO THE ANALYSIS OF RESONANCE LOOP SYSTEM FOR THE ICRF HEATING OF FUSION PLASMAS S. H. Kim, S. J. Wang, and J. G. Kwak Korea Atomic Energy Research Institute, Korea</p>
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Lobby (1F)
10:30 ~ 11:00 Coffee Break
Room 201
11:00 ~ 11:30 Closing / Introduction of CPEM 2012
Lab Tour
12:30 ~ 16:00 KRISS Lab Tour

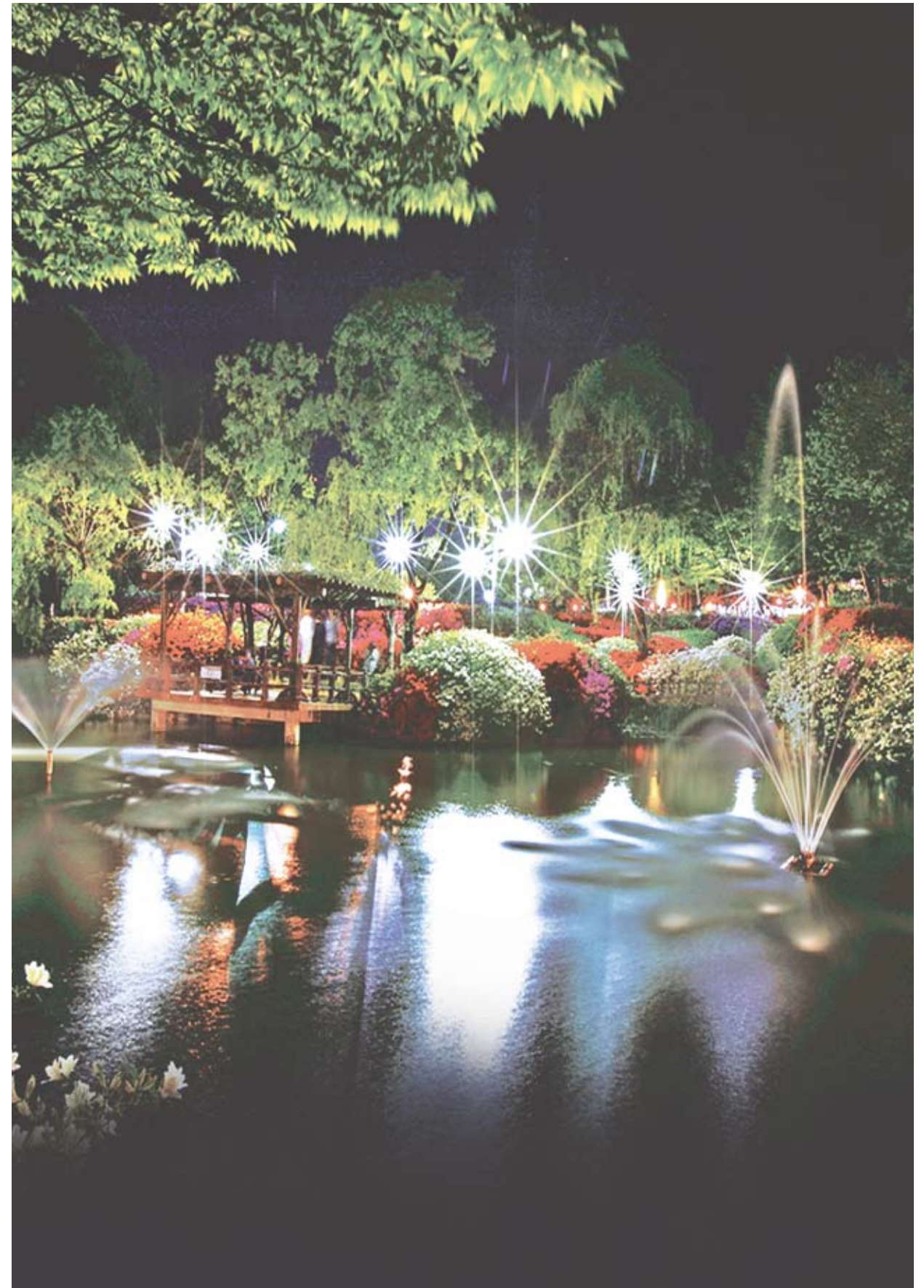


EARLY CAREER PROGRAM

The Early Career Program was started by CPEM as a means of encouraging promising professionals to enter the field of metrology and to assist in the development of their career. The program supports scientists from around the world who are in the first five years of their career in metrology, enabling them to attend the conference. They were selected on the basis of their interest in metrology, their technical ability, as demonstrated by a paper submitted for presentation at the conference, and their potential as attested to by at least one senior metrologist or educator who sponsors them. Applications were especially encouraged from developing countries. All scholarship awardees are students either in graduate or undergraduate programs, or are employed in a metrology-related position.

CPEM 2010 Early Career Awardees:

- Jan Kucera (PTB, Germany)
- Monthol Homklintian (PTB, Germany)
- Alain Rüfenacht (METAS, Switzerland)
- Yaqiong Fu (China Jiliang University, China)
- Yuan Zhong (NIM, China)
- Andrew J. Dupree (NIST, USA)
- Tim Lawson (MSL, New Zealand)
- Mathieu PIERRE (CEA, France)
- Yichi Zhang (Harbin Institute of Technology, China)
- Fred Baynes (University of Western Australia, Australia)
- Anna Lurie (University of Western Australia, Australia)
- Li Chen (NIM, China)
- Věra Nováková Zachovalová (CMI, Czech Republic)
- Luca Ferroglio (INRIM, Italy)
- Fabrizio Manta (INRIM, Italy)
- Franck BIELSA (LNE, France)
- Martin Šíra (CMI, Czech Republic)
- Philipp Mirovsky (PTB, Germany)
- Lu Yunfeng (NIM, China)
- Thomas Hagen (NMI, Australia)
- Tao Yang (Beijing Institute of Technology, China)
- Sang-Hyun Lim (NIST, USA)
- Sixten Bergman (SP Technical Research Institute of Sweden, Sweden)
- Marjan Urekar (Faculty of Technical Sciences, Serbia)
- Poonam Arora (NPLI, India)
- Suman Sharma (CSIR, India)
- Mohamed Kheir (German University, Egypt)
- Petar Mostarac (University of Zagreb, Croatia)





SATELLITE MEETINGS

Thursday / Friday, June 10-11, 2010

[SA1] International Avogadro Constant Meeting
Time: 09:00 ~ 17:00
Venue: KRISS
Chair: Peter Becker (PTB, Germany)
E-mail: peter.becker@ptb.de

Saturday, June 12, 2010

[SA2] CCEM WG on Monitoring the Kilogram
Time: 09:00 ~ 17:00
Venue: KRISS
Chair: Ian Robinson (NPL, UK)
E-mail: ian.robinson@npl.co.uk

[SA3] Euromet EM, DC & Quantum Metrology Experts Meeting
Time: 15:00 ~ 17:00
Venue: KRISS
Chair: Francois Piquemal (CNRS, France)
E-mail: francois.piquemal@lne.fr

Sunday, June 13, 2010

[SA4] CCEM WG on Radio Frequency (GT-RF)
Time: 09:00 ~ 12:00
Venue: DCC, Room 203
Chair: Jim Randa (NIST, USA)
E-mail: randa@boulder.nist.gov

[SA5] AC-DC Difference Experts Meeting
Time: 09:00 ~ 12:00
Venue: DCC, Room 204
Chair: Sung Won Kwon (KRISS, Korea)
E-mail: swkwon@kriss.re.kr

[SA6] CCEM WG on Regional Metrology Organizations (WGRMO)
Time: 14:00 ~ 16:00
Venue: DCC, Room 205
Chair: Gregory Kyriazis (Inmetro, Brazil)
E-mail: swkwon@kriss.re.kr

Tuesday, June 15, 2010

[SA7] CCEM WG on Strategic Planning
Time: 16:00 ~ 18:00
Venue: DCC, Room 203
Chair: Bill Anderson (NIST, USA)
E-mail: william.anderson@nist.gov

[SA8] SIM Electricity and Magnetism Working Group
Time: 18:30 ~ 20:00
Venue: DCC, Room 204
Chair: Gregory Kyriazis (Inmetro, Brazil)
E-mail: gakyriazis@inmetro.gov.br

Thursday, June 17, 2010

[SA9] SUNAMCO Commission C2 of IUPAP
Time: 10:30 ~ 12:30
Venue: DCC, Room 203
Chair: Peter Mohr (NIST, USA)
E-mail: mohr@nist.gov

[SA10] CPEM Executive Committee Meeting/Lunch
Time: 12:30 ~ 14:30
Venue: DCC, Room 203
Chair: James Olthoff (NIST, USA)
E-mail: james.olthoff@nist.gov

[SA11] REUNIAM (European Metrology Research Project)
Time: 18:30 ~ 20:00
Venue: DCC, Room 203
Chair: Franz J. Ahlers (PTB, Germany)
E-mail: Franz-Josef.Ahlers@ptb.de

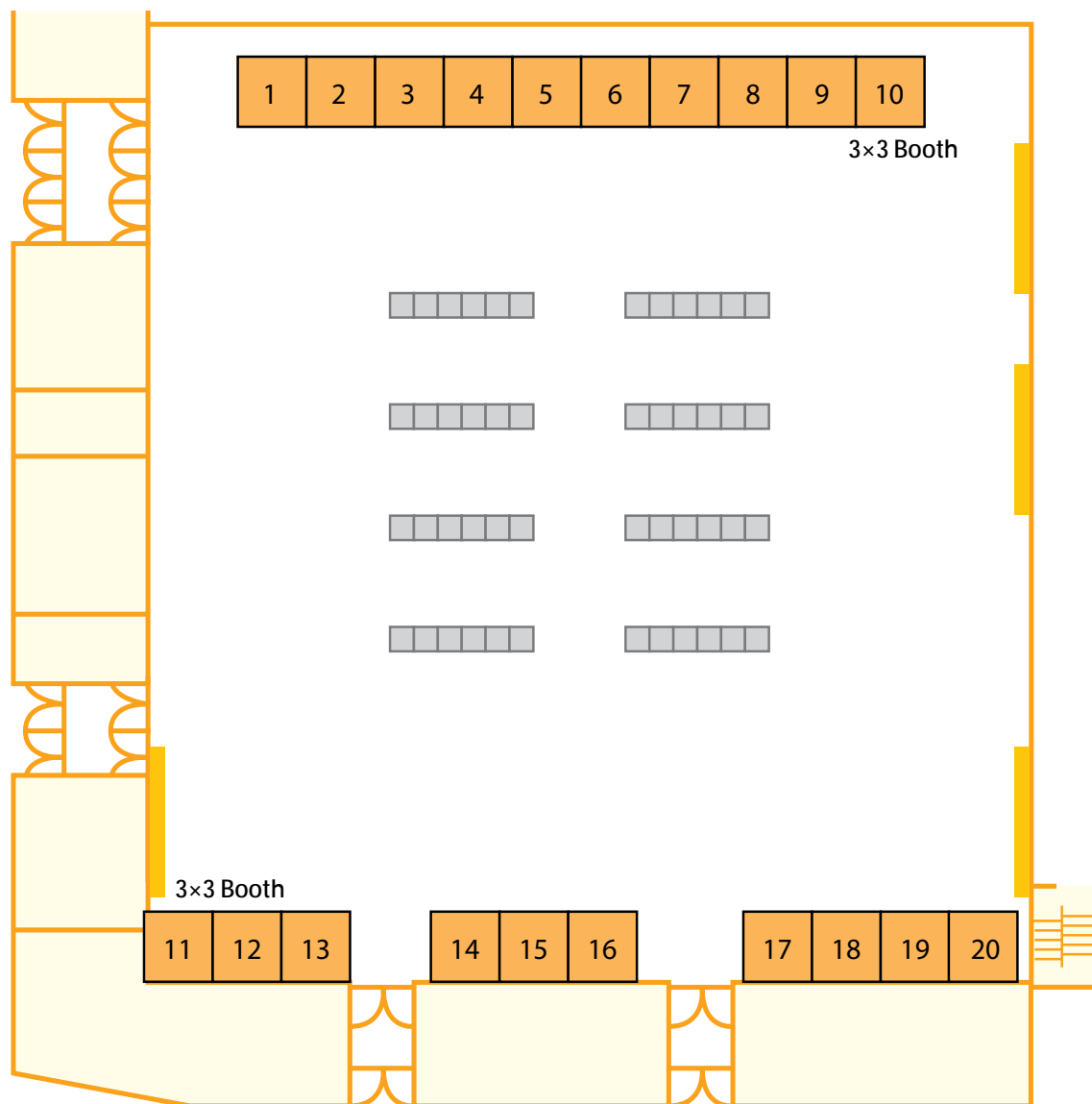
[SA12] JOSY (new European research project)
Time: 18:30 ~ 20:00
Venue: DCC, Room 204
Chair: Ralf Behr (PTB, Germany)
E-mail: ralf.behr@ptb.de

Saturday, June 19, 2010

[SA13] CODATA Task Group on Fundamental Constants
Time: 09:00 ~ 16:00
Venue: KRISS
Chair: Barry Wood (NRC, Canada)
E-mail: Barry.Wood@nrc-cnrc.gc.ca



LIST OF EXHIBITORS



• 1&2 Fluke Corporation

Fluke Corporation is one of the world's leading manufacturers of calibration and measurement equipment, accessories and software. Products are used in critical calibrations worldwide. The product line includes dc/lf electrical calibration, power calibration, process calibration, time and frequency, temperature and humidity calibration, rf calibration, pressure and flow calibration.

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www.calibration.fluke.com

• 3&4 Measurement International

Measurements International was founded in 1987 as a company with expertise in the science and engineering-intensive electrical metrology segment of the Test and Measurement Industry. Over the years MI has become a recognized global leader in the industry through active participation and contribution to the industry through industry organizations like CPEM and NCSL.

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ryanbrown@mintl.com
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• 5 ETS Lindgren

ETS-Lindgren is the leading supplier of electromagnetic test systems and equipment - including RF shielded enclosures, anechoic and reverberation chambers, as well as GTEM and TEM cells - for precise, repeatable measurements. We offer high performance biconical, dipole, pyramidal, conical, quad and double-ridged horn antennas in standard and custom designs. Quality components include RF and microwave absorber, multi-axis positioners, field probes and monitors, to name a few. Wireless Systems enable OTA, A-GPS and MIMO OTA testing of mobile devices. System solutions feature EMQuest™ software for fully automated 2- and 3-D antenna pattern measurement for passive antennas and active wireless devices.

Mr Alex Yeo

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Alex.Yeo@ets-lindgren.com
www.ets-lindgren.com

• 6 Anritsu

Anritsu (www.anritsu.co.kr) is the South Korea subsidiary of Anritsu Corporation, a global provider of innovative communications test and measurement solutions for more than 110 years. Anritsu provides solutions for existing and next-generation wired and wireless communication systems and operators. Anritsu products include wireless, optical, microwave/RF, and digital instruments as well as operations support systems for R&D, manufacturing, installation, and maintenance. Anritsu also provides precision microwave/RF components, optical devices, and high-speed electrical devices for communication products and systems. With offices throughout the world, Anritsu sells in over 90 countries with approximately 4,000 employees.

Young June Suh

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LIST OF EXHIBITORS

• 7 CPEM 2012

"The 2012 Conference on Precision Electromagnetic Measurements is hosted by the National Institute of Standards and Technology in Gaithersburg, Maryland, USA, in cooperation with NCSL International and Centro Nacional de Metrologia. The venue for this IEEE conference is the Gaylord National Resort, which is a beautiful new hotel located on the Potomac River just minutes outside of Washington D.C. We look forward to seeing you in 2012!"

Dean Jarrett

NIST, 100 Bureau Drive, STOP 8171, Gaithersburg, MD, 20899-8171, USA

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Fax: +301-926-3972

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<http://icpem.org/2012>

• 8 Guildline Instruments Ltd.

Guildline Instruments has been a premier developer and supplier of ultra-precise electrical standards and measurement instruments for over 53 years. Most National Metrology Institutes and National Laboratories use Guildline equipment as the primary vehicle for establishing traceability to fundamental electrical standards and for basic research. Most Guildline Instruments are unique and represent the only commercially available instrument capable of accuracy in the sub parts-per-million range.

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• 9 CT-eTECH Co. Ltd

In 1996, CT-eTECH Co., Ltd. was founded as a CT/PT professional productive enterprise, and now provides Low and High Voltage CT/PT, MOF, BCT(Bushing type CT), Split CT, Reference CT/PT and Test Equipment. We always try our best to provide new products and services continuously with our R&D and accumulated technology. As a result, CT-eTECH was developed various precise reference CT/PT through joint project developing with KRISS. CT-eTECH, earned trust from and beloved by the customers and endeavoring to uphold the social responsibility, is a highly trusted and sound company with creating new value through continuous technology innovation and put our best to create more prosperous society.

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• 10 Rohde & Schwarz Korea

Rohde & Schwarz Korea founded in 2000 is an exclusive Korean representative of Rohde & Schwarz. Rohde & Schwarz is an independent group of companies specializing in electronics. It is a leading supplier of solutions in the fields of test and measurement, broadcasting, radiomonitoring and radiolocation as well as mission-critical radio communications. Established more than 70 years ago in Munich, Germany, Rohde & Schwarz has a global presence and a dedicated service network in over 70 countries. Due to the comprehensive know-how and the innovative strength of its employees, Rohde & Schwarz is among the technological leaders in all of its business fields.

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siyoung.choi@rohde-schwarz.com

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• 11 Agilent Technologies Korea, Ltd.

As the world's premier measurement company, Agilent's electronic measurement business provides standard and customized electronic measurement instruments and systems, monitoring, management and optimization tools for communications networks and services, software design tools and related services that are used in the design, development, manufacture, installation, deployment and operation of electronics equipment and communications networks and services. The markets for our electronic measurement business include communications test and general purpose test In communications test.

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LIST OF EXHIBITORS

• 12 Supracon AG

Supracon is a leading supplier of customized superconducting circuits and measuring systems. Our product range includes a 10V Josephson voltage standard system based on highly integrated superconducting microwave circuits. It provides dc output voltages with an accuracy of 10⁻⁹, which makes them applicable as a primary calibration standard for high precision instrumentation. The system is available mounted on a cryocooler with no cooling liquids required or alternatively operating in liquid helium Dewar. The company is also involved in the development of programmable 10V Josephson Voltage Standards for ac applications.

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• 14 Data Proof and Ohm-Labs, Inc.

Data Proof Provides tools to automate precision DC measurements.
Ohm-Labs manufactures resistance standards, precision shunts and high voltage dividers.

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2012	USA	NIST Gaithersburg
2014	Brazil	INMETRO and INTI
2016	Canada	NRC-Canada

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