

Conference on
**Precision Electromagnetic
Measurements**



10-15 JULY 2016 • OTTAWA • CANADA

Friday, July 8, 2016

09:00 - 17:00

Satellite Meeting (By Invitation Only)

Executive Level

CCM Working Group on the Realisation of the
Kilogram (CCM WGR-kg) (By Invitation Only)

Birch Room - Executive Level

Chair: Horst Bettin, PTB

Saturday, July 9, 2016

09:00 - 17:30

16:00 - 17:00

09:00 - 17:30

Satellite Meetings (By Invitation Only)

Executive Level

CCEM Working Group on the Electrical Methods
to Monitor the Stability of the Kilogram (By
Invitation Only)

Oak Room - Executive Level

Chair: Ian Robinson, National Physical
Laboratory

Power and Energy Experts Meeting (By Invitation
Only)

Maple Room - Executive Level

Chair: Paul Wright, NPL

Chair: Gert Rietveld, VSL

Sunday, July 10, 2016

12:00 - 20:30

Registration

Nunavut

14:00 - 15:30

16:00 - 17:30

16:00 - 17:30

14:00 - 17:30

Satellite Meetings (By Invitation Only)

Executive Level

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| Informal Meeting of the APMP TCEM (By Invitation Only) Oak Room - Executive Level Chair: Murray Early, Measurement Standards Laboratory of New Zealand | CCEM Working Group of Regional Metrology Organisations (WG- RMO) (By Invitation Only) Birch Room - Executive Level Chair: Ilya Budovsky, National Measurement Institute Australia | Informal EURAMET SCLF meeting (By Invitation Only) Maple Room - Executive Level Chair: Jürgen Melcher, PTB |
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18:00 - 20:30

Welcome Reception
Provinces & Confederation Foyer

Monday, July 11, 2016

07:00 - 18:30

Registration
Nunavut

08:30 - 09:00

Opening Session
Governor General Ballroom

09:00 - 09:45

Plenary Mo-PL1: Quantum-based Voltage Metrology with Superconducting Josephson Devices at NIST
Governor General Ballroom
Presenting Author: Sam Benz, National Institute of Standards and Technology

09:45 - 10:00

Group Picture
Governor General Ballroom

10:00 - 18:00

Exhibition
Confederation Foyer

10:00 - 10:30

Coffee Break
Confederation Foyer

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|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 10:30 - 10:50 | 10:50 - 11:10 | 11:10 - 11:30 | 11:30 - 11:50 | 11:50 - 12:10 | 12:10 - 12:30 |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|

10:30 - 12:30

Mo-1 Voltage I
Governor General Ballroom
Chair: Alain Rufenacht, NIST

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|---|---|--|--|--|--|
| Investigations on Extending the Frequency Range of PJVS based AC Voltage Calibrations | Further Investigation for Piecewise Sampling to Overcome Transient Effect of Staircase Waveform | Stable arbitrary waveform generator as a transfer standard for ADC calibration | Characterization of the frequency response of Analog-to-Digital Converters | Development of high precision voltage dividers and buffer for AC voltage metrology up to 1 MHz | Design of delta-sigma feedback loop for quantum voltage digitizer |
| Presenting Author: Waldemar Guilherme Kürten Ihlenfeld, | Presenting Author: Yan Yang, National Institute of Metrology | Presenting Author: Jaani Nissila, VTT Technical Research Center of Finland Ltd, | Presenting Author: Javier Diaz de Aguilar, Centro Español de Metrología (CEM) | Presenting Author: Bjørnar Karlsen, Justervesenet | Presenting Author: Jane Ireland, National Physical Laboratory |

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|---------------|---|---|--|---|--|--|
| | INMETRO | | Centre for Metrology MIKES | | | |
| 10:30 - 12:30 | Mo-2 Power and Energy I Provinces I Chair: Gerald FitzPatrick, NIST | | | | | |
| | Power Quality Propagation Measurements in Smart Grids | Asynchronous phase comparator for characterization of devices and PMU calibrator | A Reference Merging Unit and Calibration Setup for Sampled Values over Ethernet | Accurate Phase Calibration of PMUs and PMU Calibrators | Smart Grid Power Quality and Stability Measurements in Europe | An Accurate Phase Compensation Algorithm for PMUs |
| | Presenting Author: Paul Wright, NPL | Presenting Author: Umberto Pogliano, INRIM | Presenting Author: Tapio Lehtonen, VTT MIKES Metrology | Presenting Author: Gert Rietveld, VSL | Presenting Author: Paul Wright, NPL | Presenting Author: Francisco Messina, Facultad de Ingeniería, Universidad de Buenos Aires, Argentina |
| 10:30 - 12:30 | Mo-3 Radio Frequency / Microwave I Provinces II Chair: Luciano Brunetti, Istituto Nazionale di Ricerca Metrologica (INRIM) | | | | | |
| | Mechanical Aspects in mm-wave Measurements | Comparative Modeling of Thermal Isolation Section in a Rectangular Waveguide Microcalorimeter | V-band Waveguide Microcalorimeter for Millimeter-wave Power Standards | A Nonlinear Verification Device for Nonlinear Vector Network Analyzers | Improvement of Uncertainty Analysis for Waveguide VNA Measurement at Terahertz Frequency | Establishment of Attenuation Standards of 110 GHz to 170 GHz using a mm-Wave VNA |
| | Presenting Author: Markus Zeier, METAS | Presenting Author: Xiaohai Cui, National Institute of Metrology, China | Presenting Author: Jae- Yong Kwon, KRISS | Presenting Author: David Humphreys, National Physical Laboratory | Presenting Author: Masahiro Horibe, NMIJ / AIST | Presenting Author: Anton Widarta, National Metrology Institute of Japan |
| 12:30 - 14:00 | Lunch Confederation II & III | | | | | |
| | 14:00 - 14:20 | 14:20 - 14:40 | 14:40 - 15:00 | 15:00 - 15:20 | 15:20 - 15:40 | 15:40 - 16:00 |
| 14:00 - 16:00 | Mo-4 Quantum Standards I Governor General Ballroom Chair: Jan-Theodoor Janssen, National Physical Laboratory | | | | | |
| | From AC Quantum Voltmeter to Quantum Calibrator | Simultaneous Double Waveform Synthesis with a Single Programmable Josephson Voltage Standard | Improvement of Leakage Resistance of PJVS for NIST-4 Watt Balance Experiment | Dry cooling of a 10 V programmable Josephson voltage standard array | A Differential Programmable Josephson Voltage Standard for Low- voltage Measurement | 10 Volt Automated Direct Comparison of Two Cryocooled Programmable Josephson Voltage Standards |
| | Presenting Author: Jinni Lee, Physikalisch- Technische Bundesanstalt | Presenting Author: Alain | Presenting Author: Yi- hua Tang, National Institute of Standards | Presenting Author: Michael Starkloff, Supracon AG | Presenting Author: Honghui Li, National | Presenting Author: Alain |

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| | | Rufenacht, NIST | and Technology | | Institute of Metrology | Rufenacht, NIST |
| 14:00 - 16:00 | Mo-5 Impedance I Provinces I Chair: Rado Lapuh, Metrology Institute of The Republic of Slovenia | Reference Micropotentiometer Resistors for AC-DC Transfer and Phase Error Measurements | The frequency dependence of a 10 nF gas-dielectric capacitor Presenting Author: Luca Callegaro, Istituto Nazionale di Ricerca Metrologica (INRIM) | An AC-DC Resistor based on a silicon wafer Presenting Author: Kwang Min Yu, Korea Research Institute of Standards and Science(KRISS) | Uncertainty Evaluation using the Monte-Carlo Method Presenting Author: Hyung-Kew Lee, KRISS | Traceable DC – 18 GHz Impedance Characterization of Coaxial 50 Ω Impedance Standards Presenting Author: Gert Rietveld, VSL |
| 14:00 - 16:00 | Mo-6 Current I Provinces II Chair: Jari Hällström, MIKES-VTT | Ultrastable Low-Noise Current Amplifiers With Extended Range and Improved Accuracy Presenting Author: Dietmar Drung, Physikal isch-Technische Bundesanstalt (PTB) | A New Generation of Multijunction Thermal Current Converters Presenting Author: Thomas Lipe, NIST | Improvements in the Performance of a Calibration System for Rogowski Coils at High Pulsed Currents Presenting Author: Branislav Djokic, National Research Council Canada | Expansion of the Measurement Range of AC Shunt Resistor Standard Presenting Author: Seitaro Kon, AIST,NMIJ | Development of High Current Shunts of Cage Design with Active Cooling Presenting Author: Věra Zhengkun Li, National Nováková Zachovalová, Institute of Metrology Czech Metrology Institute |
| 16:00 - 16:45 | Coffee Break Confederation Foyer | | | | | |
| 16:00 - 18:00 | Poster Sessions: Mo-PS1 to PS9 Confederation I | | | | | |
| 18:00 - 19:30 | Satellite Meeting (By Invitation Only) Executive Level | | | | | |
| 18:00 - 19:30 | Meeting of the Supplementary Comparison EURAMET.EM-S31 (By Invitation Only) Birch Room - Executive Level Chair: Juergen Schurr, PTB | | | | | |

Tuesday, July 12, 2016

07:30 - 18:30 **Registration**
Nunavut

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| 08:30 - 09:15 | Kibble Plenary Tu-PL2: Nature never deals off of the bottom of the deck... but she holds all of the aces: The joys of doing precision measurement science Governor General Ballroom Presenting Author: James Faller, The University of Colorado, and the University of Glasgow | | | | | |
| 09:15 - 10:00 | Kibble Plenary Tu-PL2: Precision Atom Interferometry Governor General Ballroom Presenting Author: Mark Kasevich, Stanford University | | | | | |
| 10:00 - 18:00 | Exhibition Confederation Foyer | | | | | |
| 10:00 - 10:30 | Coffee Break Confederation Foyer | | | | | |
| | 10:30 - 10:50 | 10:50 - 11:10 | 11:10 - 11:30 | 11:30 - 11:50 | 11:50 - 12:10 | 12:10 - 12:30 |
| 10:30 - 12:30 | Tu-1 Watt Balances I Governor General Ballroom Chair: Beat Jeckelmann, Federal Institute of Metrology METAS | | | | | |
| | First mass measurements with the NIST-4 watt balance | The METAS Watt Balance MARK II | Noise Reductions in the NRC Watt Balance | The Construction of the New Joule Balance at the NIM | Progress on the BIPM watt balance | Towards the next generation NPL watt balance |
| | Presenting Author: Darine Haddad, National Institute of Standards and Technology | Presenting Author: Ali Eichenberger, METAS | Presenting Author: Barry Wood, National Research Council Canada | Presenting Author: Zhengkun Li, National Institute of Metrology (P. R. China) | Presenting Author: Hao Fang, BIPM | Presenting Author: Ian Robinson, National Physical Laboratory |
| 10:30 - 12:30 | Tu-2 Power & Energy II Provinces I Chair: Thomas Nelson, NIST | | | | | |
| | Comparison of Two Realisations of a Power Standard | A computer-controlled calibrator for instrument transformer test sets | Calibration of Electronic Transformer with Digital Output Based on Synchronous Sampling | Precision Loss Measurement of Reactive Compensation Components by Sampling Voltage and Current | An AC Current Transformer Measuring System for Power Frequencies | Development of HF Power Source for the Calibration of Electrosurgical Analyzer |
| | Presenting Author: Ilya Budovsky, National Measurement Institute Australia | Presenting Author: Christian Mester, Federal Institute of Metrology METAS | Presenting Author: Yang Pan, Shanghai Institute of Measurement and Testing Technology | Presenting Author: Enrico Mohns, PTB | Presenting Author: Enrico Mohns, PTB | Presenting Author: Wei Zhao, National Institute of Metrology, China |
| 10:30 - 12:30 | Tu-3 Time and Frequency I Provinces II Chair: Mikko Merimaa, VTT Technical Research Centre of Finland Ltd. | | | | | |
| | QPN Limited Stability | Operational Strontium | Progress toward a new | Optical Cryogenic | Sub-Doppler laser | Dependence of Scale |

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| | and BBR Shift Uncertainty of NRC's Sr+ Atomic Clock Presenting Author: Bin Jian, National Research Council Canada | optical lattice clocks Presenting Author: Eva Bookjans, Observatoire de Paris | implementation of an In+ optical clock Presenting Author: Ying Li, National Institute of information and Communications Technology | Silicon Resonators Presenting Author: Thomas Legero, Physik alisch-Technische Bundesanstalt | spectroscopy of molecular iodine at 578 nm Presenting Author: Takumi Kobayashi, National Metrology Institute of Japan | Factor on Initial Cloud Size for an Atom-Ball Gyroscope Presenting Author: Bruno Pelle, National Institute of Standards and Technology |
| 12:30 - 14:00 | Lunch Confederation II & III | | | | | |
| 14:00 - 16:00 | Poster Sessions: Tu-PS1 to PS8 Confederation I | | | | | |
| 14:30 - 15:15 | Coffee Break Confederation Foyer | | | | | |
| | 16:00 - 16:20 | 16:20 - 16:40 | 16:40 - 17:00 | 17:00 - 17:20 | 17:20 - 17:40 | 17:40 - 18:00 |
| 16:00 - 18:00 | Tu-4 Quantum Standards II Governor General Ballroom Chair: Stephane Solve, BIPM | | | | | |
| | 2 Volt Pulse-Driven Josephson Arbitrary Waveform Synthesizer Presenting Author: Nathan Flowers-Jacobs, NIST | First Metrological Applications of the PTB 1 V Josephson Arbitrary Waveform Synthesizer Presenting Author: Luis Palafox-Gámir, PTB | Direct Comparison of a Pulse-driven JAWS and a PJVS at 1 Volt Presenting Author: Alain Rufenacht, NIST | Precision μ V- Synthesizer Based on a Pulse-driven Josephson Array Presenting Author: Ralf Behr, Physikalisch- Technische Bundesanstalt | AC-DC Calibrations With a Pulse-driven AC Josephson Voltage Standard Operated in a Small Cryostat Presenting Author: Helko van den Brom, VSL | Implementation of a Programmable Josephson Voltage Standard in a Zero Boil- off Dewar Presenting Author: Tom Stewart, Measurement Standards Laboratory of New Zealand |
| 16:00 - 18:00 | Tu-5 Impedance II Provinces I Chair: Luca Callegaro, Istituto Nazionale di Ricerca Metrologica (INRIM) | | | | | |
| | Measurement of Time Constant of Four- terminal Resistor Based on Dissipation Factor | Improvements on the Design of a Four Terminal-Pair Coaxial Bridge | Transport Behaviour and Stability of Inductors for International Comparisons | Calibration of a LCR- Meter at Arbitrary Phase Angles using a Fully Automated Impedance Simulator | Development of a programmable small capacitance standard at LNE | |
| | Presenting Author: Jian Feng, Shanghai Institute of Measurement and Testing Technology | Presenting Author: Gean Geronymo, Inmetro | Presenting Author: Jürgen Melcher, PTB | Presenting Author: Frédéric Overney, Federal Institute of Metrology METAS | Presenting Author: Olivier Thévenot, Laboratoire National de métrologie et d'Essais | |

16:00 - 18:00

Tu-6 Radio Frequency / Microwave II

Provinces II

Chair: Masahiro Horibe, NMIJ / AIST

Thermoelectric Power
Transfer Standards for
V- and W-Band

Presenting Author: Rolf
Judaschke, PTB

Characterization of high-
speed photodetectors
using a laser-based

vector network analyzer

Presenting Author: Paul
Struszewski, Physikalisc
h-Technische
Bundesanstalt

Temperature Control of
Waveguide Extenders

Presenting Author:
Johannes Hoffmann,
METAS

Uncertainty Evaluation
of Balanced S
Parameter
Measurements

Presenting Author:
Francois Ziadé, LNE

Development of
Verification Process for
On-Wafer Measurement

Frequency

Presenting Author: Ryo
Sakamaki, National
Institute of Advanced
Industrial Science and
Technology

CENAM's Primary
Standard for Microwave
Power up to 18 GHz

Presenting Author:
Mariano Botello-Perez,
CENAM

18:00 - 18:30

18:00 - 19:30

18:00 - 19:30

Satellite Meetings (By Invitation Only)

Executive Level

EURAMET EM, DC & Quantum Metrology

Experts Meeting (By Invitation Only)

Oak Room - Executive Level

Chair: Jan-Theodoor Janssen, National Physical
Laboratory

EURAMET TC-EM Working Group on Strategic

Planning WGSP (By Invitation Only)

Oak Room - Executive Level

Chair: Luca Callegaro, Istituto Nazionale di
Ricerca Metrologica (INRIM)

Wednesday, July 13, 2016

07:30 - 18:30

Registration

Nunavut

08:30 - 09:15

Plenary We-PL3: Linking the International System of Units to Fundamental Constants

Governor General Ballroom

Presenting Author: Joachim Ullrich, Physikalisch-Technische Bundesanstalt

09:15 - 10:00

Plenary We-PL3: Optical atomic clock

Governor General Ballroom

Presenting Author: Jun Ye, National Institute of Standards and Technology and University of Colorado

10:00 - 18:00

Exhibition

Confederation Foyer

10:00 - 10:30

Coffee Break

Confederation Foyer

10:30 - 10:50

10:50 - 11:10

11:10 - 11:30

11:30 - 11:50

11:50 - 12:10

12:10 - 12:30

10:30 - 12:30

We-1 Quantum Standards III

Governor General Ballroom

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| 10:30 - 12:30 | Chair: Antti Manninen, VTT Technical Research Centre of Finland Ltd | | | | | |
| | Accuracy verification of single-electron pumps with 0.2 ppm uncertainty | Universality of the tunable-barrier electron pump at the part-per-million level | Robustness of single-electron pumps at sub-ppm level | Robustness of Potential-Profile-Tunable Electron Pump | Scaling the current from a GHz electron pump using a CCC | Towards a programmable quantum current generator |
| | Presenting Author: Frank Hohls, Physikalisch-Technische Bundesanstalt | Presenting Author: Stephen Giblin, National Physical Laboratory | Presenting Author: Frank Hohls, Physikalisch-Technische Bundesanstalt | Presenting Author: Myung-Ho Bae, Korea Research Institute of Standards and Science | Presenting Author: Stephen Giblin, National Physical Laboratory | Presenting Author: Wilfrid Poirier, Laboratoire National de métrologie et d'Essais |
| 10:30 - 12:30 | We-2 Impedance III | | | | | |
| | Provinces I | | | | | |
| | Chair: Ralf Behr, Physikalisch-Technische Bundesanstalt | | | | | |
| 10:30 - 12:30 | Impedance Bridge Based on Pulse-Driven Josephson Arrays for Arbitrary Impedance Ratios | Systematic Error Analysis in a Josephson Impedance Bridge | Josephson-Based Full Digital Bridge for High-Accuracy Impedance Comparisons | A three-arm 4TP digitally-assisted bridge for the comparison of arbitrary impedances | A Digital Four-Terminal Pair Impedance Bridge | Large Capacitance Measurement System Based on Dual Balance Bridge |
| | Presenting Author: Stephan Bauer, Physikalisch-Technische Bundesanstalt | Presenting Author: Thomas Hagen, PTB | Presenting Author: Frédéric Overney, Federal Institute of Metrology METAS | Presenting Author: Massimo Ortolano, Politecnico di Torino | Presenting Author: Waldemar Guilherme Kürten Ihlenfeld, INMETRO | Presenting Author: You Li, Beijing Orient Institute of Measurement and Test |
| | We-3 Voltage II | | | | | |
| 12:30 - 14:00 | Provinces II | | | | | |
| | Chair: Ilya Budovsky, National Measurement Institute Australia | | | | | |
| | 10 V Transconductance Amplifier for the Comparison of Josephson Standards and Thermal Converters | Low-Voltage AC-DC transfer standards at NMIJ | A Simple Model for the Prediction of AC-DC Difference of Multi-Junction Thermal Converters | Calibration of Inductive Voltage Dividers at Power Frequencies Using an AC-PJVS | Establishing of 1000V Multi-decade Inductive Voltage Divider Standard at NIM | Improved Setup for Bridge Standard Calibration up to 5 kHz |
| 12:30 - 14:00 | Presenting Author: Ilya Budovsky, National Measurement Institute Australia | Presenting Author: Hiroyuki Fujiki, National Metrology Institute of Japan | Presenting Author: Stefan Cular, National Institute of Standards and Technology | Presenting Author: Jimmy Hsu, Center for Measurement Standards (CMS/ITRI) | Presenting Author: Wei Wang, National Institute of Metrology P.R.China | Presenting Author: Marc Beug, Physikalisch-Technische Bundesanstalt |
| | Lunch | | | | | |
| | Confederation II & III | | | | | |
| 14:00 - 16:00 | 14:00 - 14:20 | 14:20 - 14:40 | 14:40 - 15:00 | 15:00 - 15:20 | 15:20 - 15:40 | 15:40 - 16:00 |
| | We-4 Fundamental Constants I | | | | | |
| | Governor General Ballroom | | | | | |
| | Chair: Horst Bettin, PTB | | | | | |

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| Mass measurement of ²⁸ Si-enriched spheres at NMIJ for determination of the Avogadro constant | Results from the Magnetic Suspension Mass Comparator for Vacuum-to-Air Mass Dissemination | Comparison of two methods for determining the sorption correction for a vacuum-realized kilogram | Improvements of A Kilogram Level Inertial Mass Measurement Experiment | Piston Guide and Magnet Assembly for the KRISS Watt Balance | Surface layer analysis of Si spheres both in vacuum and in air by an improved ellipsometer |
| Presenting Author: Shigeki Mizushima, National Metrology Institute of Japan | Presenting Author: Corey Stambaugh, National Institute of Standards and Technology | Presenting Author: Patrick Abbott, NIST | Presenting Author: Zhuang Fu, Tsinghua University | Presenting Author: Kwang-Cheol Lee, KRISS | Presenting Author: Kazuaki Fujita, National Metrology Institute of Japan / National Institute of Advanced Industrial Science and Techno |

14:00 - 16:00

We-5 Power & Energy III

Provinces I

Chair: Rene David Carranza, Centro Nacional De Metrologia

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|---|---|--|--|---|---|
| A Calibration Setup for IEC 61850-9-2 Test Sets | Calibration of 90° Phase An Electronic Load to Difference Measured by Verify Harmonic Digital Sampling Method | Emission Compliance | A Proposal to Establish a System for Calibration of Harmonic Power Analyzers | Improvement of Agilent 3458a Performances in Wideband Complex Transfer Function Measurement | Harmonics and Interharmonics Spectral Analysis by ANN |
| Presenting Author: Marco Agustoni, Federal Institute of Metrology (METAS) | Presenting Author: Jian Feng, Shanghai Institute of Measurement and Testing Technology | Presenting Author: Peter Davis, National Physical Laboratory | Presenting Author: Hongtao Huang, National Institute of Metrology | Presenting Author: Domenico Giordano, Istituto Nazionale di Ricerca Metrologica | Presenting Author: Javier Diaz de Aguilar, Centro Español de Metrología (CEM) |

14:00 - 16:00

We-6 Resistance I

Provinces II

Chair: François Piquemal, LNE

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| Convenient graphene-based quantum Hall resistance standards | Magnetocapacitance and Dissipation Factor of Epitaxial Graphene Hall Bars | Millimeter-sized Graphene Quantum Hall Devices for Resistance Standards | Tests of Series Quantum Hall Arrays Based on Epitaxial Graphene | Towards a cryogen-free table-top primary resistance standard | AC quantum Hall effect in epitaxial graphene |
| Presenting Author: Wilfrid Poirier, Laboratoire National de métrologie et d'Essais | Presenting Author: Juergen Schurr, PTB | Presenting Author: Yanfei Yang, National Institute of Standards and Technology | Presenting Author: Antti Manninen, VTT Technical Research Centre of Finland Ltd | Presenting Author: Jan-Theodoor Janssen, National Physical Laboratory | Presenting Author: Felix Lüönd, METAS |

16:00 - 16:45

Coffee Break

Confederation Foyer

16:00 - 18:00

Poster Sessions: We-PS1 to PS7

Confederation I

18:15 - 19:00 **Transportation from the Westin to the Banquet Venue**
Canadian Museum of History

19:00 - 21:00 **Banquet at the Canadian Museum of History**
Canadian Museum of History

21:00 - 21:30 **Transporation from the Banquet Venue to the Westin**
Canadian Museum of History

Thursday, July 14, 2016

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|--|--|--|---|--|--|---|--|--|---|--|--|---|--|---|--|
| 08:00 - 18:30 | Registration Nunavut 08:30 - 08:50 08:50 - 09:10 09:10 - 09:30 09:30 - 09:50 09:50 - 10:10 | | | | | | | | | | | | | | |
| 08:30 - 10:10 | Th-1 Voltage III Governor General Ballroom Chair: Yi-hua Tang, National Institute of Standards and Technology <table border="0"> <tr> <td>Measurement of Boltzmann Constant Using Superconducting Integrated Circuit</td> <td>Accuracy of the New Voltage Standard Using Josephson Junctions Cooled to 77 K</td> <td>Temperature sensitivity coefficients of the BIPM secondary voltage standards</td> <td>Development of a Compact Zener DC Voltage Standard with Detachable Module System</td> <td>Digital Phase Standard of High Accuracy up to the MHz-Range</td> </tr> <tr> <td>Presenting Author: Chiharu Urano, National Institute of Advanced Industrial Science and Technology</td> <td>Presenting Author: Alexander Klushin, Institute for Physics of Microstructures of the Russian Academy of Sciences (IPM RAS)</td> <td>Presenting Author: Stephane Solve, BIPM</td> <td>Presenting Author: Nobu-Hisa Kaneko, NMIJ/AIST</td> <td>Presenting Author: Waldemar Guilherme Kürten Ihlenfeld, INMETRO</td> </tr> </table> | | | | | Measurement of Boltzmann Constant Using Superconducting Integrated Circuit | Accuracy of the New Voltage Standard Using Josephson Junctions Cooled to 77 K | Temperature sensitivity coefficients of the BIPM secondary voltage standards | Development of a Compact Zener DC Voltage Standard with Detachable Module System | Digital Phase Standard of High Accuracy up to the MHz-Range | Presenting Author: Chiharu Urano, National Institute of Advanced Industrial Science and Technology | Presenting Author: Alexander Klushin, Institute for Physics of Microstructures of the Russian Academy of Sciences (IPM RAS) | Presenting Author: Stephane Solve, BIPM | Presenting Author: Nobu-Hisa Kaneko, NMIJ/AIST | Presenting Author: Waldemar Guilherme Kürten Ihlenfeld, INMETRO |
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| 08:30 - 10:10 | Th-2 Power & Energy IV Provinces I Chair: Eddy So, National Research Council Canada <table border="0"> <tr> <td>Study on High-Frequency Power Calibration Technology for Electrosurgical Analyzer</td> <td>Phase Shift Correction of Reference Sampling Multimeter for Electronic Transformer Calibration</td> <td>Upgrade of Accuracy and Traceability the SP Sampling Wattmeter</td> <td>Traceability and On-Site Frequency Calibration of the NRC-MSS Depolarization Current Measurements</td> <td>Frequency Calibration of MV Voltage Transformer under Actual Waveforms</td> </tr> <tr> <td>Presenting Author: Wei Zhao, National Institute of Metrology, China</td> <td>Presenting Author: Yang Pan, Shanghai Institute of Measurement and Testing Technology</td> <td>Presenting Author: Stefan Svensson, SP National Research Inst. of Sweden</td> <td>Presenting Author: Refat Ghunem, National Research Council Canada</td> <td>Presenting Author: Gabriella Crotti, Istituto Nazionale di Ricerca Metrologica</td> </tr> </table> | | | | | Study on High-Frequency Power Calibration Technology for Electrosurgical Analyzer | Phase Shift Correction of Reference Sampling Multimeter for Electronic Transformer Calibration | Upgrade of Accuracy and Traceability the SP Sampling Wattmeter | Traceability and On-Site Frequency Calibration of the NRC-MSS Depolarization Current Measurements | Frequency Calibration of MV Voltage Transformer under Actual Waveforms | Presenting Author: Wei Zhao, National Institute of Metrology, China | Presenting Author: Yang Pan, Shanghai Institute of Measurement and Testing Technology | Presenting Author: Stefan Svensson, SP National Research Inst. of Sweden | Presenting Author: Refat Ghunem, National Research Council Canada | Presenting Author: Gabriella Crotti, Istituto Nazionale di Ricerca Metrologica |
| Study on High-Frequency Power Calibration Technology for Electrosurgical Analyzer | Phase Shift Correction of Reference Sampling Multimeter for Electronic Transformer Calibration | Upgrade of Accuracy and Traceability the SP Sampling Wattmeter | Traceability and On-Site Frequency Calibration of the NRC-MSS Depolarization Current Measurements | Frequency Calibration of MV Voltage Transformer under Actual Waveforms | | | | | | | | | | | |
| Presenting Author: Wei Zhao, National Institute of Metrology, China | Presenting Author: Yang Pan, Shanghai Institute of Measurement and Testing Technology | Presenting Author: Stefan Svensson, SP National Research Inst. of Sweden | Presenting Author: Refat Ghunem, National Research Council Canada | Presenting Author: Gabriella Crotti, Istituto Nazionale di Ricerca Metrologica | | | | | | | | | | | |
| 08:30 - 10:10 | Th-3 Impedance IV Provinces II | | | | | | | | | | | | | | |

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| | Chair: Jürgen Melcher, PTB | | | | |
| | Determination of impedance meter nonlinearity with a capacitance build-up method | The Optimal Hollow Active Auxiliary Electrode and Its Additional Functions Research | Evaluation of a Continuously Variable Calculable Capacitor | Progress Report on Measuring the von Kiltzing Constant at the BIPM | Progress report on the determination of RK at LNE |
| | Presenting Author: Faranak Pourdanesh, Istituto Nazionale di Ricerca Metrologica (INRIM); Politecnico di Torino | Presenting Author: Lu Huang, National Institute of Metrology, China | Presenting Author: Yicheng Wang, NIST | Presenting Author: Pierre Gournay, BIPM | Presenting Author: Olivier Thévenot, Laboratoire National de métrologie et d'Essais |
| 10:00 - 16:00 | Exhibition Confederation Foyer | | | | |
| 10:00 - 10:30 | Coffee Break Confederation Foyer | | | | |
| | 10:30 - 10:50 | 10:50 - 11:10 | 11:10 - 11:30 | 11:30 - 11:50 | 11:50 - 12:10 |
| 10:30 - 12:30 | Th-4 Quantum Standards IV Governor General Ballroom Chair: Nick Fletcher, Bureau International des Poids et Mesures (BIPM) | | | | |
| | Universality test of the quantum Hall effect on topological insulator | Direct Comparison of Fractional and Integer Quantized Hall Resistances: Status and Perspectives | Development of 1-M Ω Quantum Hall Array Resistance Standards | Investigation of Niobium nanoSQUIDs Based on Nanobridge Junctions | A direct DC 10 V comparison between the NIMJ and the BIPM Programmable Josephson Voltage Standards |
| | Presenting Author: Tetsuro Misawa, NMIJ, AIST | Presenting Author: Franz Ahlers, PTB | Presenting Author: Takehiko Oe, NMIJ/AIST | Presenting Author: Xueshen Wang, National Institute of Metrology | Presenting Author: Yasutaka Amagai, National Metrology Institute of Japan |
| 10:30 - 12:30 | Th-5 Time and Frequency II Provinces I Chair: François Nez, Laboratoire Kastler Brossel /CNRS/UPMC/ENS | | | | |
| | Study of the OP-PTB Link by Carrier-Phase Two-Way Satellite Time and Frequency Transfer | Current Status of Terahertz Frequency Metrology at NICT | NIST on a Chip with Alkali Vapor Cells: Initial Results | Iodine Absorption Cells Quality Evaluation | Laser Refractometer as a Transfer Standard of the Pascal |
| | Presenting Author: Joseph Achkar, LNE-SYRTE / Observatoire | Presenting Author: Motohiro Kumagai, National Institute of Information and | Presenting Author: John Kitching, NIST | Presenting Author: Jan Hrabina, Institute of Scientific Instruments v.v.i., Czech Academy of Sciences | Using small mass and force metrology for laser power measurement |
| | | | | Presenting Author: Patrick Egan, NIST | Presenting Author: Gordon Shaw, U.S. National Institute of Standards and |

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| | de Paris | Communications Technology | | | | Technology (NIST) |
| 10:30 - 12:30 | Th-6 Radio Frequency / Microwave III Provinces II Chair: Ron Ginley, NIST | | | | | |
| | Comparison between time- and frequency-domain high-frequency device characterizations | Comparison of Calibration Methods for Multiport VNAs up to 67 GHz | Quantum Based RF E-field Sensing by Using Two-photon Transition in Rydberg Atoms | Measurement Uncertainty of Free Space Antenna Factor for BI-log Antenna Using Amplitude Center | Investigation of Peak Envelope Power Measurements and Uncertainties | A Signal Processing Approach for Recovery of High-Q Dielectric Resonance Profile Measurements |
| | Presenting Author: Mark Bieler, Physikalisch-Technische Bundesanstalt | Presenting Author: Djamel Allal, Laboratoire National de Métrologie et d'Essais (LNE), Trappes, France | Presenting Author: Zhenfei Song, National Institute of Metrology (NIM), China | Presenting Author: Satoru Kurokawa, National Institute of Advanced Industrial Science and Technology of Japan | Presenting Author: Yu Song Meng, National Metrology Centre, A*STAR | Presenting Author: Brian O'Keefe, Tufts University |
| 12:30 - 14:00 | Lunch Confederation II & III 12:30 - 15:00 | | | | | |
| | 18:00 - 19:30 | | | | | |
| 12:30 - 19:30 | Satellite Meetings (By Invitation Only) Executive Level CPEM Executive Committee Meeting (By Invitation Only) Oak Room - Executive Level Chair: Dean Jarrett, National Institute of Standards and Technology | | | | | |
| | ACQ-PRO Project Meeting Oak Room - Executive Level Chair: Javier Diaz de Aguilar, Centro Español de Metrología (CEM) | | | | | |
| 14:00 - 16:00 | Poster Sessions: Th-PS1 to PS8 Confederation I | | | | | |
| 14:30 - 15:15 | Coffee Break Confederation Foyer | | | | | |
| 16:00 - 18:00 | Exhibition Teardown Confederation Foyer | | | | | |
| | 16:00 - 16:20 | 16:20 - 16:40 | 16:40 - 17:00 | 17:00 - 17:20 | 17:20 - 17:40 | 17:40 - 18:00 |
| 16:00 - 18:00 | Th-7 Fundamental Constants II Governor General Ballroom Chair: Peter Mohr, NIST | | | | | |
| | Laser spectroscopy of muonic deuterium : new contribution to the | Improved spectral aberration in Johnson Noise Thermometry | High Resolution Spectroscopy of 1S-3S Transition in Hydrogen | Upgrading the NIST Electrostatic Force Balance | An Oscillating Magnet Watt Balance | Towards a test of the Weak Equivalence Principle of gravity using |

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| | proton puzzle | | | | Presenting Author: Haji anti-hydrogen at CERN Ahmadov, TÜBİTAK |
| | Presenting Author: François Nez, Laboratoire Kastler Brossel /CNRS/UPMC/ENS | Presenting Author: Alessio Pollaro, NIST | Presenting Author: Helene Fleurbaey, Laboratoire Kastler Brossel / UPMC / CNRS / ENS | Presenting Author: Julian Stirling, National Institute of Standards and Technology | Presenting Author: François Nez, Laboratoire Kastler Brossel /CNRS/UPMC/ENS |
| 16:00 - 18:00 | Th-8 Resistance II Provinces I Chair: Murray Early, Measurement Standards Laboratory of New Zealand Third Generation of Adapted Wheatstone Bridge for High Resistance Measurements at NIST Presenting Author: Shamith Payagala, NIST/JQI Th-9 Novel Sensors / Magnetics Provinces II Chair: Po Gyu Park, Korea Research Institute of Standards and Science (KRISS) Time-resolved detection Methods for of the berry curvature in characterization and GaAs nanostructures minimization of microwave background Presenting Author: Mark in cryogenic Bieler, Physikalisch- Technische Bundesanstalt Presenting Author: Feipeng Lin, National Institute of Metrology, China Presenting Author: Waldemar Guilherme Kürten Ihlenfeld, INMETRO Presenting Author: Nobu-Hisa Kaneko, NMIJ/AIST Presenting Author: Takehiko Oe, NMIJ/AIST Presenting Author: Dean Jarrett, National Institute of Standards and Technology | | | | |
| 16:00 - 18:00 | Quantum Hall Resistance Traceability for the NIST-4 Watt Balance Evaluation of the Automatic Coaxial Mechanical Scanner for High-Resistance Measurement Use Development of 1 Ω and 10 Ω Metal Foil Standard Resistors Development of an AC Current Comparator Based Resistance Measurement System Ultra-High Resistance Measurement Based on Non-Contact Electrostatic Voltmeter Presenting Author: Feipeng Lin, National Institute of Metrology, China Presenting Author: Waldemar Guilherme Kürten Ihlenfeld, INMETRO Presenting Author: Nobu-Hisa Kaneko, NMIJ/AIST Presenting Author: Takehiko Oe, NMIJ/AIST Presenting Author: Dean Jarrett, National Institute of Standards and Technology | | | | |
| | Digital Control of Magnetic Induction Waveform Applied to Silicon Steel Sheets Characterization Identification and correction of artefact in the measurement of pulsed magnetic fields Coplanar Capacitive sensor for Measuring Horizontal Displacement in Joule Balance Presenting Author: Yang Bai, Harbin Institute of Technology Presenting Author: Domenico Giordano, Istituto Nazionale di Ricerca Metrologica Presenting Author: Matheus Pinheiro, Universidade Federal de Goiás | | | | |

Friday, July 15, 2016

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| 08:00 - 11:30 | Registration Nunavut 08:30 - 08:50 08:50 - 09:10 09:10 - 09:30 09:30 - 09:50 09:50 - 10:10 10:10 - 10:30 | | | | |
| 08:30 - 10:30 | Fr-1 Avogadro I Governor General Ballroom Chair: Michael Stock, BIPM | | | | |

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| The new Kilogram Materialized by Silicon Isotopes | Realization of the Kilogram Based on the Planck Constant at NMIJ | A Two Thickness Interferometer for Lattice Strain Investigations | Surface characterization Measurement of silicon spheres by combined XRF and XPS analysis | reproducibility of PTB's sphere interferometer after more than a decade | Comparison of Mean Diameters of Si-Spheres Measured with both PTB-Sphere Interferometers |
| Presenting Author: Frank Haertig, Physikalisch-Technische Bundesanstalt | Presenting Author: Naoki Kuramoto, National Institute of Advanced Industrial Science and Technology | Presenting Author: Enrico Massa, INRIM - Istituto Nazionale di Ricerca Metrologica | Presenting Author: Michael Kolbe, Physikalisch-Technische Bundesanstalt | Presenting Author: Arnold Nicolaus, PTB Physikalisch-Technische Bundesanstalt | Presenting Author: Torsten Mai, Physikalisch-Technische Bundesanstalt |

08:30 - 10:30

Fr-2 Power & Energy V

Provinces I

Chair: Enrico Mohns, PTB

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| A Buildup Method for Determining the Voltage Coefficient of High Voltage Resistors | Bilateral high voltage AC peak and rms value comparison up to 150 kV between MIKES-VTT and PTB | Voltage Dependence Measurement of a 110 kV LVE-TSVT | Traceability of No-Load Loss Measurements of High Voltage Transmission Lines | Research on Quantity Traceability for High Accuracy Two-stage Voltage Transformer | Design and Self-calibration of the RVD with Serial-parallel Connection |
| Presenting Author: Harold Parks, National Research Council Canada | Presenting Author: Jari Hällström, MIKES-VTT | Presenting Author: Haiming Shao, National Institute of Metrology | Presenting Author: Eddy So, National Research Council Canada | Presenting Author: Huanghui Zhang, School of Instrumentation Science and Opto-electronics Engineering, Beihang University | Presenting Author: Xianlin Pan, NIM |

08:30 - 10:30

Fr-3 Radio Frequency / Microwave IV

Provinces II

Chair: David Humphreys, National Physical Laboratory

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| Estimation of waveform state levels and uncertainties using the histogram and shorth methods | Permittivity measurements for high-permittivity materials at NMIJ using resonator methods | An experimental set-up to compare measurements and simulations in MRI dosimetry | Measurement of High-Permittivity Dielectric Characteristics at Microwave and mm-wave | Leakage Effects in Millimeter-Wave Power Transfer Standards | Microwave Radiometry of Blackbody Radiation |
| Presenting Author: Mark Bieler, Physikalisch-Technische Bundesanstalt | Presenting Author: Yuto Kato, National Institute of Advanced Industrial Science and Technology | Presenting Author: Michele Borsero, INRIM | Presenting Author: Young-Pyo Hong, Korea Research Institute of Standards and Science | Presenting Author: Rolf Judaschke, PTB | Presenting Author: Dazhen Gu, National Institute of Standards and Technology |

10:30 - 11:00

Coffee Break

Confederation Foyer

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| 11:00 - 11:30 | Closing Session Governor General Ballroom |
| 11:30 - 12:00 | Transportation to NRC |
| 12:00 - 16:00 | NRC Laboratory Tour National Research Council Laboratory Facility |
| 16:00 - 16:30 | Transportation to the Westin Hotel |

Saturday, July 16, 2016

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| 09:00 - 16:00 | Satellite Meetings (By Invitation Only) | |
| | Executive Level | |
| | SIM Electricity and Magnetism Metrology Working Group (By Invitation Only) | CODATA Task Group on Fundamental Constants (TGFC) (By Invitation Only) |
| | Quebec Room | Oak Room - Executive Level |
| | Chair: Lucas Daniel Di Lillo, Instituto Nacional De Tecnologia Industrial INTI | Chair: David Newell, NIST |