



Automatic RF Techniques Group

84th ARFTG Microwave Measurement Conference

St. Julien Hotel in Boulder, Colorado

TECHNICAL AGENDA

Thursday, December 4

0800 to 0810

Welcome

Conference Chair: Ron Ginley, NIST

0810 to 0930

Session A: Remote Sensing and Noise Measurements

Session Chair: Mohamed Sayed, MMS

ThA-1 INVITED: CubeSat-based Radiometer Systems from Millimeter-wave to Terahertz: Enabling Frequent Global Observations of the Earth's Atmosphere

0810-0850 S. C. Reising, Colorado State University, Fort Collins, Colorado, United States

ThA-2 Comparison of Noise-Parameter Measurement Strategies: Simulation Results for Amplifiers

0880-0910 J. Randa, NIST, Boulder, Colorado, United States

ThA-3 On-wafer Differential Noise Figure Measurement without Couplers on a Vector Network Analyzer

0910-0930 Y. Andee^{1,2}, A. Siligaris^{1,2}, F. Graux³, F. Danneville⁴, ¹Univ. Grenoble Alpes, Grenoble, France, ²CEA, Grenoble, France, ³Rohde&Schwarz France, Meudon-la-Foret, France, ⁴IEMN, Villeneuve d'Ascq, France

0930 to 1100

Break – Exhibits and Interactive Forum

Session Chair: Mitch Wallis, NIST

ThP-01 Evaluation and Validation of a National WR-15 (50 to 75 GHz) Power Measurement System

X. Cui¹, Y. Meng², Y. Shan², W. Yuan¹, C. Ma¹, Y. Li¹, ¹National Institute of Metrology, Beijing, China, ²National Metrology Centre, Singapore, Singapore

ThP-02 A Near-Field Scanning Microwave Microscope for Measurement of the Permittivity and Loss of High-Loss Materials

A. P. Gregory¹, J. F. Blackburn¹, K. Lees¹, R. N. Clarke¹, T. E. Hodgetts², S. M. Hanham³, N. Klein³, ¹National Physical Laboratory, Teddington, United Kingdom, ²Consultant on behalf of the National Physical Laboratory, Teddington, United Kingdom, ³Imperial College, London, United Kingdom

ThP-03 Measurement Uncertainty in Waveguide VNA Calibrated by Offset Short Calibration with Oversized Waveguide Aperture at Sub-millimeter Wave Frequency

M. Horibe, R. Kishikawa, AIST, Tsukuba, Japan

ThP-04 Broadband Dielectric Spectroscopy Calibration Using Calibration Liquids with Unknown Permittivity

S. Liu¹, I. Ocket^{2,1}, P. Barmuta^{3,1}, T. Markovic¹, A. Lewandowski³, D. Schreurs¹, B. Nauwelaers¹, ¹University of Leuven, Heverlee, Belgium, ²Interuniversity Microelectronics Center, Heverlee, Belgium, ³Warsaw University of Technology, Warsaw, Poland

ThP-05 Progress Towards a NIST Microwave Brightness Standard for Remote Sensing

D. Houtz, D. K. Walker, D. Gu, National Institute of Standards and Technology, Boulder, United States

ThP-06 Development of an Automated Unintended Radiated Emission (URE) Radio Frequency (RF) Measurement System

J. E. Friedel¹, A. P. Burr¹, V. V. Nguyen², ¹Naval Surface Warfare Center Indian Head Explosive Ordnance Disposal Technology Division, Indian Head, United States, ²Naval Surface Warfare Center Indian Head Explosive Ordnance Disposal Technology Division, Indian Head, United States

1100 to 1200 **Session B: mm-Wave and THz Measurements**

Session Chair: Jon Martens, Anritsu

ThB-1 Novel Flexible Dielectric Waveguide for Millimeter and Sub-Millimeter Frequencies – Design and Characterization

1100- H. Nickel, J. Zovo, Spinner GmbH, Feldkirchen-Westerham, Germany
1120

ThB-2 Evaluating the Effect of Using Precision Alignment Dowels on Connection Repeatability of Waveguide Devices at Frequencies from 750 GHz to 1.1 THz

1120- N. Ridler¹, R. Clarke², ¹National Physical Laboratory, Teddington, United Kingdom, ²University of Leeds, Leeds, United
1140 Kingdom

ThB-3 Accuracy and Repeatability of Automated Non-Contact Probes for On-wafer Characterization

1140- C. Caglayan, G. C. Trichopoulos, K. Sertel, ElectroScience Laboratory, Columbus, United States
1200

1200 to 1300 **Lunch**

1300 to 1320 **ARFTG Business Meeting**

1320 to 1440 **Session C: Measurements for Communications Technology and Nonlinear Applications**

Session Chair: Dave Blackham, Keysight

ThC-1 INVITED: Free-Field Measurements of Integrated Wireless Devices in Reverberation Chambers

1320- K. Remley, NIST, Boulder, United States
1400

ThC-2 On High Frequency / mm-Wave IMD Measurements with Small Tone Spacing

1400- J. Martens, Anritsu, Morgan Hill, United States
1420

ThC-3 A Test Set-up for the Analysis of Multi-Tone Intermodulation in Microwave Devices

1420- J. Teyssier¹, J. Sombrin², R. Quéré¹, S. Laurent¹, G. Francis³, ¹XLIM-cnrs, Brive la Gaillarde, France, ²XLIM-Labex, Limoges,
1440 France, ³CNES, Toulouse, France

1440 to 1600 **Break – Exhibits and Continuation of the Interactive Forum**

Session Chair: Mitch Wallis, NIST

1600 to 1700 **Session D: On-wafer measurements**

Session Chair: Peter Aaen, University of Surrey

ThD-1 Via-Adjusted Microstrip Launch for Sub-Terahertz Wafer Probing

1600- K. Jung, J. Ebner, Cascade Microtech Inc., Beaverton, United States
1620

ThD-2 Adaptive Estimation of Complex Calibration Residual Errors of Wafer-Level S-Parameters Measurement System

1620- A. A. Savin¹, V. G. Guba², A. Rumiantsev³, B. D. Maxson⁴, S. Schubert⁵, U. Arz⁵, ¹Tomsk State University of Control
1640 Systems and Radioelectronics, Tomsk, Russian Federation, ²NPK Tair, Tomsk, Russian Federation, ³MPI Corporation,
Chu-Pei City, Taiwan, ⁴Copper Mountain Technologies, Indianapolis, United States, ⁵Physikalisch-Technische
Bundesanstalt (PTB), Braunschweig, Germany

ThD-3 LZZM: An Extension of the Theory LZZ Calibration Technique

1640- M. A. Pulido-Gaytan¹, J. A. Reynoso-Hernandez¹, A. Zarate-de Landa¹, J. R. Loo-Yau², M. C. Maya-Sanchez¹, ¹Cicese,
1700 Ensenada, Mexico, ²Cinvestav, Guadalajara, Mexico

Friday, December 5

0800 to 0920 **Session E: Materials Characterization**

Session Chair: Mitch Wallis, NIST

FrE-1 INVITED: Noncontact Conductivity and Dielectric Measurement for High Throughput Roll-to-Roll Nanomanufacturing

0800- N. Orloff, NIST, Boulder, United States
0840

FrE-2 Study of Reflection Effect at Fixture Interfaces on Permittivity Measurements using the Transmission/ Reflection Method

0840- Y. Kato, M. Horibe, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan
0900

FrE-3 Free-space Reconstruction of the Electrical Properties of Carbon Nanotube Composites in the Q-band

0900-0920 A. M. Hassan, J. Obrzut, E. J. Garboczi, National Institute of Standards and Technology, Gaithersburg, United States

0920 to 1040 **Break – Exhibits**

1040 to 1200 **Session F: Calibration and Verification**

Session Chair: Nick Ridler, NPL

FrF-1 A Calibration Procedure for Electronic Calibration Units

1040-1100 J. Stenarson¹, C. Eij², K. Yhland¹, ¹SP Technical Research Institute of Sweden, Boras, Sweden, ²NPL National Physical Laboratory, Teddington, Middlesex, United Kingdom

FrF-2 Offset-Shorts Vector-Network-Analyzer Calibration with Simultaneous Modeling of Calibration Standards

1100-1120 A. Lewandowski¹, W. Wiatr¹, P. Barmuta², ¹Warsaw University of Technology, Warsaw, Poland, ²KU Leuven, Leuven, Belgium

FrF-3 Two-Port Calibration Insensitive to Flange Misalignment

1120-1140 A. Arsenovic¹, R. M. Weikle², J. Hesler¹, ¹Virginia Diodes, Charlottesville, United States, ²University of Virginia, Charlottesville, United States

FrF-4 Residual Error Analysis of a Calibrated Vector Network Analyzer

1140-1200 F. A. Mubarak, VSL, Delft, Netherlands

1200 to 1300 **Lunch**



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