



Automatic RF Techniques Group

90th ARFTG Microwave Measurement Conference

St. Julien Hotel in Boulder, Colorado

TECHNICAL AGENDA

Thursday, November 30

0800 to 0810

Welcome

Conference Chair: Ron Ginley, NIST

0810 to 0930

Session A: Keynote Talk & On-Wafer Measurements Part 1

Session Chair: Jon Martens, Anritsu

ThA-1 KEYNOTE: Wireless Technology – Game-Changing Solutions of Integration

0810-0850 Ke Wu, Poly-Grames Research Center, Department of Electrical Engineering, Polytechnique Montreal, Quebec, Canada

ThA-2 An Intra-laboratory Investigation of On-Wafer Measurement Reproducibility at Millimeter-wave Frequencies

0880-0910 Roland G Clarke¹, Chong Li², and Nick Ridler³

¹ University of Leeds, UK, ² University of Glasgow, UK, ³ National Physical Laboratory, UK

ThA-3 110 GHz On-Wafer Measurement Comparison on Alumina Substrate

0910-0930 Thorsten Probst¹, Ralf Doerner², Matthias Ohlrogge³, Roger Lozar³, and Uwe Arz¹

¹ Physikalische-Technische Bundesanstalt (PTB), Braunschweig, Germany, ² Ferdinand-Braun Institut, Leibniz-Institut für Höchstfrequenztechnik, Berlin, Germany, ³ Fraunhofer-Institut für Angewandte Festkörperphysik, Freiburg, Germany

0930 to 1100

Break – Exhibits and Interactive Forum

Session Chair: Mitch Wallis, NIST

ThP-01 Kicking the Tires of the NIST Microwave Uncertainty Framework – Part 2

Ron Ginley, NIST, Boulder, Colorado, USA

ThP-02 Development of a Verification Technique for On-wafer Noise Figure Measurement Systems

Aihua Wu¹, Chen Liu¹, Chong Li², Jing Sun¹, and Yibang Wang¹

¹ Hebei Semiconductor Research Institute, Shijiazhuang, China, ² University of Glasgow, UK

ThP-03 G-band Reflectivity Results of Conical Blackbody for Radiometer Calibration

Derek A. Houtz and Dazhen Gu, NIST, Boulder, Colorado, USA

ThP-04 Quantifying Variance Components for Repeated Scattering Parameter Measurements

Amanda Koepke and Jeff Jargon, NIST, Boulder, Colorado, USA

ThP-05 Background Measurement of System Nonlinearity Using Spread-Spectrum Methods

Adam Wichman and Lawrence Larson, Brown University, Providence, Rhode Island, USA

1100 to 1200 **Session B: Panel on Future RF Instrumentation**

Session Moderator: Dylan Williams, NIST

1200 to 1300 **Lunch**

1300 to 1320 **ARFTG Business Meeting**

1320 to 1440 **Session C: Novel Application Areas for RF and Microwave Measurements**

Session Chair: Jeff Jargon, NIST

ThC-1 INVITED: Rydberg Atom Electric-Field Metrology

1320- Josh A. Gordon, Matthew T. Simons, and Christopher L. Holloway, NIST, Boulder, United States
1400

ThC-2 Measurement of Sub-Degree Angular Carbon Fiber Tow Misalignment

1400- William C. Wilson¹, Jason P. Moore¹, and Hunter McCraw²
1420 ¹NASA Langley Research Center, Hampton, Virginia, USA ²Embry-Riddle Aeronautical University, Prescott, Arizona, USA

ThC-3 Demonstration of RF Impedance Matching Techniques or Near-Field Scanning Microwave Microscopy Based on Atomic Force Microscopy

1420- Masahiro Horibe, Iku Hirano, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan
1440

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

Session Chair: Mitch Wallis, NIST

1600 to 1700

Session D: Calibration, Verification, and De-embedding

Session Chair: Jim Booth, NIST

ThD-1 Qualitative Multidimensional Calibration Comparison

1600- Aric W. Sanders, Ron Ginley, Richard Chamberlin, Jasper Drisko, Christian Long, and Nathan Orloff, NIST, Boulder,
1620 Colorado, USA

ThD-2 Establishing Traceability for SOLT Calibration Kits

1620- Ron Ginley, NIST, Boulder, Colorado, USA
1640

ThD-3 How to Extract Distributed Circuit Parameters from the Scattering Parameters of a Transmission Line

1640- Nate Orloff, NIST, Boulder, Colorado, USA
1700

Friday, December 1

0830 to 0950

Session E: On-Wafer Measurements Part 2

Session Chair: Leonard Hayden, Qorvo

FrE-1 INVITED: Characterization of fluid permittivity to 110 GHz by microwave microfluidics

0830- Chris J. Long¹, Nathan D. Orloff¹, Cully Little^{1,2}, Xiao Ma^{1,3}, Angela Stelson¹, Jasper Drisko¹, Isaac E. Hanemann^{1,2}, Ami
0910 Thakrar^{1,4}, Jordi Mateu^{1,5,6}, Jim Hwang³, and Jim Booth¹, ¹NIST, Boulder, Colorado, USA, ²University of Colorado, Boulder,
USA, ³Lehigh University, Bethlehem, Pennsylvania, USA, ⁴University of California, Berkeley, USA ⁵Universitat Politècnica
de Catalunya, Barcelona, Spain ⁶Centre Tecnològic de Telecomunicacions de Catalunya, Barcelona, Spain

FrE-2 Coplanar Waveguide for Dielectric Material Measurements at Frequencies from 140 GHz to 200 GHz

0910- Xiue Bao¹, Song Liu², Ilja Ocket^{1,3}, Juncheng Bao¹, Dries Kil¹, Shengkang Zhang², Chunyue Cheng², Keming Feng², Bob
0930 Puers¹, Dominique Schreurs¹, and Bart Nauwelaers¹, ¹KU Leuven, Belgium, ²Beijing Institute of Radio Metrology and
Measurement, Beijing, China, ³Interuniversity Microelectronics Center (IMEC), Heverlee, Belgium

FrE-3 Establishing Traceability for On-Wafer S-Parameter Measurements of Membrane Technology Devices up to 110 GHz

0930- Uwe Arz¹, Sherko Zinal¹, Thorsten Probst¹, Gerd Hechtfisher², Franz-Josef Schmückle³, and Wolfgang Heinrich³,
0950 ¹Physikalische-Technische Bundesanstalt (PTB), Braunschweig, Germany, ²Rohde & Schwarz, GmbH & Co. München,
Germany, ³Ferdinand-Braun Institut, Leibniz-Institut für Höchstfrequenztechnik, Berlin, Germany

0950 to 1100

Break – Exhibits

1100 to 1140

Session F: Non-linear Measurements

Session Chair: Dominique Schreurs, KU Leuven

FrF-1 Characterization of Transmission Lines with Nonlinear Dielectric Materials

1100-1120 Aaron M. Hagerstrom, NIST, Boulder, Colorado, USA

FrF-2 Load-Pull Measurement for Device-Technology Comparison

1120-1140 Leonard Hayden and Sonja Nedeljkovic, Qorvo, Inc., Hillsboro, Oregon, USA

1200 to 1300

Lunch



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