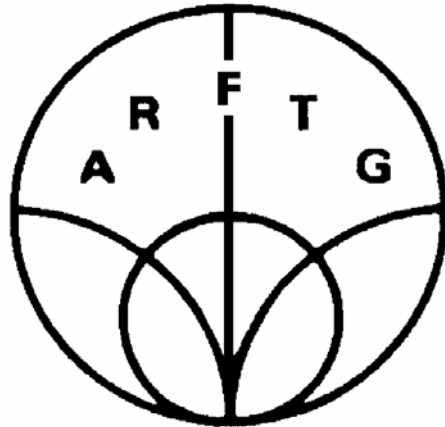


66th ARFTG Microwave Measurements Conference



# Measurements of High Performance Devices and Applications

1-2 December 2005  
Washington Marriott  
Washington DC

ARFTG Microwave Measurements Conference  
General Chair: John G. Burns  
Technical Program Chair: Mohamed Sayed

## Thursday - 1 December

7:30-8:30 **Breakfast**

8:30-8:45 **Welcome and Opening Remarks**

8:45-10:05 **Session 1**

### **Emerging Technologies**

Edward Godchalk, Session Chair

8:45-9:15

#### **“Demonstration of Carbon Nanotube Field Effect Transistor Operation at 23 GHz”**

Aaron A. Pesetski, James E. Baumgardner, James Murduck, Erica Folk,  
John Przybysz, John D. Adam, and Hong Zhang  
Northrop Grumman Corporation, Linthicum, MD

9:15-9:40

#### **“Hot S-Parameter Techniques: $6 = 4 + 2$ ”**

Jan Verspecht<sup>1</sup>, Denis Barataud<sup>2</sup>, Jean-Pierre Teyssier<sup>2</sup> and  
Jean-Michel Nebus<sup>2</sup>

<sup>1</sup> Jan Verspecht bcba, Belgium

<sup>2</sup> IRCOM-CNRS, University of Limoges, Brive, France

9:40-10:05

#### **“325 to 500 GHz Vector Network Analyzer System”**

Charles Olsen, Anthony Denning, and Yuenie Lau  
OML Inc

10:05-10:45 **Break and Exhibitor Introduction**

10:45-12:25 **Session 2**

### **High Performance Devices**

William Eisenstadt, Session Chair

10:45-11:10

#### **“IP<sub>3</sub> Estimation from Gain Compression of RF Power Amplifiers”**

Choongeol Cho, Yus Ko, and William R. Eisenstadt  
University of Florida, Dept. of Electrical and Computer Engineering,  
Gainesville, FL

**11:10-11:35**

**“Comparison of Multisine Measurement from Instrumentation Capable of Nonlinear System Characterization”**

Kate A. Remley<sup>1</sup>, Paul D. Hale<sup>2</sup>, David I Bergman<sup>3</sup>, and Darryl Keenan<sup>2</sup>  
National Institute of Standards and Technology, Boulder, CO.

<sup>1</sup> Electromagnetics Division

<sup>2</sup> Optoelectronics Division

<sup>3</sup> Quantum Electrical Metrology Division

**11:35-12:00**

**“Technique for Assessing PNA Measurement Repeatability Using A NIST Standard”**

Nazia Akil<sup>1</sup> and Brett Grossman<sup>2</sup>

<sup>1</sup> University of California Davis

<sup>2</sup> Intel Corporation, Hillsboro, OR

**12:00-12:25**

**“Measurement-Based Performance Evaluation of WIMAX Transceiver designs”**

Huseyin Arslan<sup>1,2</sup> and Daljeet Singh<sup>1</sup>

<sup>1</sup> Anritsu Company, Morgan Hill, CA

<sup>2</sup> University of South Florida, Tampa, FL

**12:25-1:30 Lunch**

**1:30-2:45**

**Session 3**

**Measurement and Calibration**

Leonard Hayden, Session Chair

**1:30-1:55**

**“Calibration Errors When Neglecting Crosstalk”**

Leonard Hayden

Cascade Microtech, Beaverton, OR

**1:55-2:20**

**“Uncertainty Analysis for the 65 GHz Termination Calibrated by Using the Vector Network Analyzer”**

Yeou-Song (Brian) Lee

Anritsu Corporation, Morgan Hill, CA

**2:20-2:45**

**“Inter-Laboratory Comparison of S-Parameter and Noise Parameter Measurements on CMOS Devices with 0.13  $\mu\text{m}$  Gate Length”**

James Randa<sup>1</sup>, Susan L. Sweeney<sup>2</sup>, Tom McKay<sup>3</sup>, David K. Walker<sup>1</sup>,  
David R. Greenberg<sup>2</sup>, Jon Tao, Judah Mendez<sup>3</sup>, G. Ali Rezvani<sup>3</sup>, and John  
J. Pekarik<sup>2</sup>

<sup>1</sup> Electromagnetics Division, National Institute of Standards and  
Technology, Boulder, CO

<sup>2</sup> IBM, Semiconductor Research and Development Center, Essex Junction,  
VT

<sup>3</sup> RF Micro Devices, Scotts Valley, CA

**2:45-3:20 Business Meeting and Election of Officers**

**3:20-3:40 Break**

**3:40-5:00 Session 4  
Poster Session**

Jan Verspecht, Session Chair

**“Design of a Single Chip Antenna Combined with Coplanar Matching Circuit and Duplexer”**

Haruichi Kanaya, Kewnta Seki, and Keiji Yoshida  
Department of Electronics, Graduate School of Information Science and  
Electical Engineering, Kyusu University, Fukuoka, Japan

**“GaN FET’s Non-Linear Model Constructed by Adaptive Multi-Bias S-Parameter Measurements”**

D. Xiao<sup>1</sup>, D. Schreurs<sup>1</sup>, C van Niekerk<sup>2</sup>, W, De Raedt<sup>3</sup>, J. Derluyn<sup>3</sup>, M.  
Germain<sup>3</sup>, B. Nauwelaers<sup>1</sup>, and G, Borghs<sup>5</sup>

<sup>1</sup> EE Department of K.U., Leuven, Belgium and also E.E. Department of  
K.U., Leuven, Belgium

<sup>2</sup> E.E. Department of University of Stellenbosch, Matieland, South Africa

<sup>3</sup> IMEC, MCP, Kapeldreef, Leuven, Belgium

<sup>4</sup> E.E. Department of K.U., Leuven, Belgium

<sup>5</sup> IMEC, MCP, Kapeldreef, Leuven, Belgium and also with Physics  
Department of K.U., Leuven, Belgium

**“Statistical Analysis for Accuracy in Noise Figure Measurements”**

N. Ortega, J.M. Collantes, and M. Sayed<sup>1</sup>

Electricity and Electronics Department, University of the Basque Country,  
Bilbao, Spain

<sup>1</sup> Microwave & Millimeter Wave Solutions, Santa Rosa, CA

**“Measuring Nonlinear Devices to Retrieve Good System-Level Models”**

Ludwig De Locht<sup>1,2</sup>, Gerd Vanderstyeen<sup>1,2</sup>, Yves Rolain<sup>2</sup>,  
and Daan Rabins<sup>2</sup>

<sup>1</sup> IMEC, Wireless Research, Kapeldref, Heverlee, Belgium

<sup>2</sup> Vrije Universiteit Brussels, Dept ELEC, Brussels, Belgium

**6:00-7:00 Social hour at Marrakesh Moroccan Restaurant**

**7:00-9:30 Conference dinner at Marrakesh Moroccan Restaurant**

## **Friday - 2 December**

**7:30-8:30 Breakfast**

**8:30-11:45 Session 5  
High Power Measurements**

Kate Remley, Session Chair

**8:30-9:30**

**“Wide Bandgap Semiconductors**

*What are they, how do you identify one, and what are they good for?”*

Greg DeSalvo, Anders Walker, and John G. Burns

Northrop Grumman Corporation, Linthicum, MD

**9:30-10:00**

**“Time Domain Harmonic Load-Pull of an AlGaIn/GaN HEMT”**

Fabian De Groote<sup>1</sup>, Oliver Jardel<sup>1</sup>, Jan Verspecht<sup>2</sup>, Denis Barataud<sup>1</sup>, Jean-  
Pierre Teyssier<sup>1</sup>, and Raymond Quere<sup>1</sup>

<sup>1</sup> IRCOM-CNRS, University of Limoges, Brive, France

<sup>2</sup> Jan Verspecht bcba, Gertudeveld 15, 1840 Steenhuffel, Belgium

**10:00-10:45 Break**

## Session 5 continued

**10:45-11:15**

### **“Constructing and Benchmarking a Pulsed-RF, Pulsed-Bias S-Parameter System”**

Charles P. Baylis II<sup>1</sup>, Lawrence P. Dunleavy<sup>1,2</sup>, and Jon Martins<sup>3</sup>

<sup>1</sup> Center for Wireless and Microwave Information Systems, Department of Electrical Engineering, University of South Florida

<sup>2</sup> Modelithics Inc, Tampa, FL

<sup>3</sup> Anritsu Company, Morgan Hill, CA

**11:15-11:45**

### **“RF Probing of Custom ASICs”**

Bruce Bullard<sup>1</sup>, Rich McNamar<sup>1</sup>, and Sean McNally<sup>2</sup>

<sup>1</sup> Atmel Corporation, Colorado Springs, CO

<sup>2</sup> Linear Technology Corporation, Colorado Springs, CO

**11:45-1:00 Lunch**

**1:00-2:00 Panel Session**

### **High Power Measurements Challenges and Future Trends**

Mohamed Sayed, Session Chair

**Panel Members :** Jan Verspecht, Larry Dunleavy, Jon Martens, Gary Simpson, and Jean-Pierre Teyessier

**2:00-2:45 Break**

**2:45-5:00 Included Workshop**

### **Future of High-Speed Electrical Waveform Metrology**

**Organizers :** Dylan Williams and Paul Hale

**Presenters :** Jim Mueller (LeCroy)

Christopher Silva (The Aerospace Corp.)

Leonard Hayden (Cascade Microtech)

This workshop will address emerging issues in electrical waveform metrology required to support modern telecommunications and wireless applications. The workshop will focus on new classes of high-bandwidth electrical instruments that must measure both temporal and frequency-domain signals and, because of the high frequencies involved, must be mismatch corrected, magnitude and phase calibrated, and may generate energy beyond connector cutoff frequencies. The workshop will focus on new high-speed oscilloscopes, vector signal analyzers, high-speed pattern generators, bit error rate testers, and large-signal analyzers.