



AUTOMATIC RF TECHNIQUES GROUP

NEWSLETTER

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Fall 2008 ARFTG Microwave Measurement Symposium: “Time Domain and Frequency Domain Measurement”

OVERVIEW



*The Red Lion Jantzen Beach Hotel, Portland, Oregon,
venue for the Fall 2008 ARFTG Symposium*

The Fall 2008 ARFTG Microwave Measurement Symposium took place at the Red Lion Jantzen Beach Hotel, Portland, Oregon, over four days from Tuesday, December 9th, to Friday, December 12th. The symposium consisted of a conference, two workshops, a training course and a users' forum. The theme of this year's symposium was "Time Domain and Frequency Domain Measurement". The symposium 'main event' was the 72nd ARFTG Microwave Measurement Conference, which took place on Thursday, and Friday morning. However, this was accompanied by four other not-to-be-missed events: the NIST/ARFTG Microwave Measurement Short Course (held on Tuesday, and Wednesday morning), a Nonlinear Measurement

Workshop (on Wednesday afternoon); the NVNA Users' Forum and a Signal Integrity Workshop (both held on Friday afternoon). Taken together, this amounted to four days packed with exciting activities for RF and microwave engineers and technologists.

This newsletter gives reviews of these activities. There are also brief accounts of other events of interest to the ARFTG community. To obtain more information on ARFTG and its activities, including details of conferences past, present and future, visit the ARFTG website at www.arftg.org.

SHORT COURSE

The Fall 2008 ARFTG Microwave Measurement Symposium began with the 14th annual NIST/ARFTG Microwave Measurement Short Course. This highly successful event provides training, given by acknowledged experts in the field, in most areas of interest to today's RF and microwave measurement community.

Day one of this one-and-a-half day course covered the fundamentals of microwave measurement, including measurement of: connectorized and on-wafer S-parameters; power; large-signals; thermal and phase noise. Evaluating uncertainty of measurement was also covered during day one of the course. Day two contained lectures that related specifically to the theme of the symposium. These included: high-speed oscilloscope measurements; time domain network analyzer measurements; and, signal and power integrity measurements. This year, 35 people attended the course.

For information on ARFTG courses, visit www.arftg.org or contact the ARFTG Education Chair and Short Course Organizer, Dominique Schreurs (dominique.schreurs@ieee.org).



Short course lecturer, Dylan Williams, introduces the subject of on-wafer S-parameter measurements to the course attendees

NONLINEAR MEASUREMENT WORKSHOP

This year's ARFTG Nonlinear Measurement Workshop was organized by Valeria Teppati, of Politecnico di Torino, Italy, and was held immediately after the NIST/ARFTG Short Course. The workshop contained talks on the following topics: Sampling Oscilloscope Metrology for Modulated Signals; Waveform Engineering and its Applications; Comparison of Passive and Active Load-Pull Systems in High Power Amplifier Measurement Applications; Advanced Time Domain Load-Pull Characterization of Microwave Power Transistors; and, Stability of Harmonic Phase Reference in a Specific Example of Load-Pull System.

The workshop was attended by approximately 40 people and was a great success. Thanks are due to all those that were involved in the workshop – especially Valeria Teppati, who did an excellent job as workshop organizer. Suggestions for future workshop topics should be sent to the ARFTG Workshops Chair, Jean-Pierre Teyssier (teyssier@brive.unilim.fr).

CONFERENCE TECHNICAL SESSIONS

The 72nd ARFTG Microwave Measurement Conference began with an introduction by Tom Ruttan, the Conference Chair. Tom thanked Leonard Hayden, Technical Program Chair, and Evan Fledell, Conference

Host, for their help in organizing the conference. Our congratulations go to Tom, Leonard and Evan for putting together a really first-rate conference packed with interesting papers, with the overall theme “Time Domain and Frequency Domain Measurement”. The conference received sponsorship from several organizations: the ‘gold’ sponsors were Anritsu, Cascade Microtech and Tektronix; the ‘silver’ sponsor was Intel.

The conference consisted of nine sessions, three of which were interactive sessions featuring papers given as poster presentations. The other sessions consisted of papers given as oral presentations. All papers have been published in the conference digest CD (copies of which can be ordered from www.arftg.org). On this occasion, over 60 people attended the conference.

Voted by the conference attendees as the best oral paper presentation was, “A New Noise Parameter Measurement Method Results in more than 100x Speed Improvement and Enhanced Measurement Accuracy”, by G Simpson¹, D Ballo², J Dunsmore² and A Ganwani¹ (¹Maury Microwave Corporation, ²Agilent Technologies). The best interactive forum paper presentation was “A Simple Method for Extreme Impedance Measurement – Experimental Testing”, by M Randus and K Hoffmann (Czech Technical University, Prague). The best exhibitor was voted as Agilent Technologies.

CONFERENCE EXHIBITS

The exhibits area gave conference attendees an excellent opportunity to see the latest range of products available from some of the leading suppliers in the RF and microwave test and measurement industry.



Conference attendees are given ample opportunity to visit the conference exhibits area

The following companies chose to exhibit at this conference: Agilent Technologies, Anritsu, Cascade Microtech, Colby Instruments, Focus Microwaves, Gigatronix, Maury Microwave Corporation, NMDG, Rohde & Schwarz, Sonnet Software, Southwest Microwave, SUSS MicroTec, Tegam, and Tektronix. To exhibit at future conferences, please contact the ARFTG Exhibits Chair at exhibits@arftg.org.

ANNUAL BUSINESS MEETING

The annual ARFTG Business Meeting was held on December 11th, 2008, during the 72nd conference. A significant part of this meeting consisted of electing five members to the ARFTG Executive Committee (ExCom). Biographies for the candidates were distributed prior to voting. The outcome of the voting was the re-election of two existing members of ExCom, Ken Wong and Uwe Arz, and the election of three new members of ExCom, Rusty Myers, Jon Martens and Brett Grossman. ARFTG thanks Joe Tauritz, Tom Ruttan and Ray Tucker, who chose not to stand for re-election to ExCom, for their valuable contributions to ARFTG whilst members of ExCom.

STUDENT FELLOWSHIP

The annual ARFTG Business Meeting also gave an opportunity to announce the latest recipient of the ARFTG Microwave Measurement Student Fellowship award. The purpose of the fellowship award is to recognize and provide financial assistance to graduate students who show promise and interest in pursuing research related to improvement of RF and microwave measurement techniques. The fellowship award is \$5000. This year's successful applicant for this award is Mohammad Shabi Hashmi, of Cardiff University, UK. Congratulations to Mohammad! The next deadline for applications for the fellowship award is 1st October 2009. Further details can be found at: www.arftg.org.

CONFERENCE AWARDS

ARFTG President, Leonard Hayden, presided over the awards ceremony, which also took place during the ARFTG Business Meeting. Certificates of appreciation were presented to the organizers of the conference, namely: Tom Ruttan, Conference Chair; Evan Fledell, Conference Host; Leonard Hayden, Technical Program Chair; Dominique Schreurs, Short Course Director; Valeria Teppati, Nonlinear Measurement Workshop organizer; Ali Boudiaf, Signal Integrity Workshop organizer; Jean-Pierre Teyssier, NVNA Users' Forum Organizer; Joe Tauritz, the ARFTG Exhibits Chair; and, the Session Chairs – Brett Grossman, Ken Wong, Jean-Pierre Teyssier, Kate Remley, Tom Ruttan,

Nick Ridler and Evan Fledell. Awards were also given for the best oral paper presentation (by Uwe Arz), best interactive forum paper presentation (by Andrej Rumiantsev) and best exhibitor (Tektronix) from the previous (71st) conference held in Atlanta, Georgia.

Four special ARFTG awards were made during the awards dinner, which took place during the evening of December 11th. These were: ARFTG Career Award, to Roger Pollard; ARFTG Distinguished Service Award, to John Gregory Burns; ARFTG Honorary Membership Award, to Raymond Tucker; and, ARFTG Certificate of Appreciation, to Edna Marie Taylor.

NVNA USERS' FORUM - US

The ARFTG NVNA (Nonlinear Vector Network Analyzer) Users' Forum held a meeting on the Friday afternoon, immediately after the ARFTG Microwave Measurement Conference. On this occasion, approximately 20 people attended this informal meeting that comprised two discussion topics, some research updates and an open discussion. Kate Remley and Paul Hale, of NIST, were the moderators for the first discussion topic, titled "The Comb Generator: Phase Reference and Traceability". The second discussion topic, titled "Is Envelope Load-Pull Necessary", was moderated by Basim Noori, of Freescale Semiconductor. The Forum organizers were Jean-Pierre Teyssier and Dominique Schreurs. A summary of this meeting will be made available at www.arftg.org.

HIGH SPEED DIGITAL SIGNAL INTEGRITY WORKSHOP

The Fall 2008 ARFTG Symposium concluded with a workshop, on the Friday afternoon, which ran in parallel with the NVNA Users' Forum. This workshop was titled "Multiport/Differential Measurements for Signal Integrity Workshop" and was organized by Mike Resso, of Agilent Technologies, and Ali Boudiaf, of Focus Microwave. The workshop contained talks on the following topics: Multiport and Mixed-Mode Measurements; Model-to-Measurement Correlation Through Automated Error Vector Magnitude Calculation; Crosstalk at the BGA Ball-Out Presents Significant Challenges for Multi-Gigabit ATE At-Speed Testing; Utilizing 12-port S-Parameters for Backplane Analysis; and, Analysis and Characterization of Differential RF Devices.

The workshop was attended by approximately 40 people and was a great success. Thanks are due to all those that were involved, especially Mike Resso and Ali Boudiaf who did an excellent job as workshop organizers.

OTHER RECENT EVENTS:

NVNA USERS' FORUM - EUROPE

The NVNA Users' Forum – Europe meeting took place during European Microwave Week 2008 and formed one of the technical sessions of this conference on Thursday October 30th. The topics presented and discussed included: Characterization and Modeling of Direct Conversion Transmitters; A Generalized Time-Domain Waveform Test-Set; Demystifying Device Related Memory Effects using Waveform Engineering and Envelope Domain Analysis; and, Pulse Profiling for AlGaIn/GaN HEMTs Large Signal Characterizations. The Forum was Chaired by Gottfried Magerl, of Vienna University of Technology, and Co-Chaired by Jean-Pierre Teyssier, of the University of Limoges XLIM. A summary of the meeting will be available at www.arftg.org.

FUTURE EVENTS

Summer 2009 ARFTG activities

Microwave Measurement Conference

The 73rd ARFTG Microwave Measurement Conference will be held on June 12th, 2009, in Boston, Massachusetts, as part of Microwave Week 2009, which also includes the IEEE MTT-S International Microwave Symposium (www.ims2009.org) and the Radio Frequency Integrated Circuits symposium (www.rfic2009.org). The theme for the ARFTG conference is "Practical Applications of Nonlinear Measurements". For more information, contact the Conference Chair, Charles Wilker, (wilker@ieee.org), or the Technical Program Chair, Dave Blackham, (dave_blackham@agilent.com). Alternatively, for up-to-date information on the conference (including dates for submission of papers, exhibits information, etc), visit www.arftg.org.



The Boston Convention Center, venue for the 73rd ARFTG Microwave Measurement Conference

NVNA Users' Forum - International

The ARFTG NVNA Users' Forum will also hold a meeting during Microwave Week 2009. For more information, please contact the Forum organizers: Dominique Schreurs (dominique.schreurs@ieee.org), Kate Remley (remley@boulder.nist.gov) or John Wood (john.wood@freescall.com).

NVNA Users' Forum - Europe

It is planned to hold a meeting of the ARFTG NVNA Users' Forum during European Microwave Week 2009, which takes place from September 28th to October 2nd, in Rome, Italy. More information on European Microwave Week 2009 can be found at: www.eumweek.com.

Fall 2009 ARFTG Symposium

The Fall 2009 ARFTG Microwave Measurement Symposium will be held in Broomfield, Colorado, from Tuesday, December 1st, to Friday, December 4th. It is planned to hold the 74th ARFTG Microwave Measurement Conference, the NIST/ARFTG Short Course, a Nonlinear Measurement Workshop and the ARFTG NVNA Users' Forum during this symposium. For more information, contact the Conference Chair, Ron Ginley (rginley@boulder.nist.gov), or the Technical Program Chair, Dave Walker (dwalker@boulder.nist.gov). Alternatively, information will also be available, in due course, at www.arftg.org.

IN MEMORY OF BRIAN PUGH



On November 14th, Brian Pugh, and two colleagues at SiPort Inc, were fatally shot, reportedly, by a recently fired employee. Brian was caring, understanding, and a good listener – the last person you would think would be a target for this type of violence. Brian is survived by his wife Carol and two young children who were known to many of us as they traveled to multiple ARFTG meetings. Brian was a past ARFTG President and Executive Committee member. We miss Brian and our thoughts remain with him and his family.