AUTOMATIC RF TECHNIQUES GROUP

NEWSLETTER

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67th ARFTG Microwave Measurement Conference: "Measurements and Design of High Power Devices and Systems"

OVERVIEW

The Renaissance Parc 55 Hotel – venue for the 67th ARFTG Microwave Measurement Conference

More than 170 attendees participated in the 67th ARFTG Microwave Measurement Conference that took place at the Renaissance Parc 55 Hotel, San Francisco, California, on June 16th, 2006. This conference formed part of Microwave Week 2006, which also included the International Microwave Symposium (IMS), the Radio Frequency Integrated Circuits (RFIC) symposium, and many workshops, tutorials and other meetings. As well as its conference, ARFTG also sponsored a meeting of the NVNA Users' Forum and two joint ARFTG/IMS Workshops. Taken together, these activities ran from Sunday, June 11th, through to Friday, June 16th.

A CD of the IMS digest is available from the IEEE Online Catalog & Store at www.ieee.org. This CD also contains the digest to the 67th ARFTG conference as well as the earlier 66th conference held in December 2005.

More information on ARFTG and its activities, including details of conferences past, present and future, can be found on the ARFTG website at www.arftg.org.

CONFERENCE TECHNICAL SESSIONS

The 67th ARFTG conference began with introductions from Ken Wong, Conference Chair, and Mohamed Sayed, Technical Program Chair. The overall conference theme was "Measurements and Design of High Power Devices and Systems", which further sub-divided into three technical sessions and an interactive forum. The technical sessions consisted of papers given as oral presentations. These technical sessions were titled "Forward to Large Signal Measurements", "High Power Device Measurements", and "VNA Measurements and System

Characterizations". The interactive forum featured a total of 22 papers presented as posters during the breaks from the technical sessions.

Selected by the conference attendees as the best paper from the technical sessions was "Tracking the Waveform of Microwave Oscillators" by Y Rolain, W Van Moer, J Schoukens and R Pintelon (VUB, Belgium). Selected as the best paper from the interactive forum was "An Enhanced Line-Reflect-Reflect-Match Calibration" by Leonard Hayden (Cascade Microtech, Oregon). Selected as Best Exhibitor at the conference was NMDG Engineering.

Interactive forum papers are presented as posters to encourage technical interactions between attendees

As on previous occasions, the ARFTG conference also included an exhibits area and an awards luncheon, both of which are described below.

CONFERENCE EXHIBITS

A total of eleven companies chose to exhibit their latest equipment at this conference. These companies were: Agilent Technologies, AnaPico, BroadWave Technologies, Cascade Microtech, Focus Microwaves, Maury Microwave Corporation, NMDG Engineering, Rohde & Schwarz, Southwest Microwave, SUSS MicroTec and Tektronix. To exhibit at future conferences, please contact the ARFTG Exhibits Chair, Joe Tauritz (jltauritz@ieee.org).

Attendees are given ample opportunity to discuss technical matters with exhibitors at the conference and to examine the latest range of test equipment

AWARDS LUNCHEON

ARFTG President, Greg Burns, presided over the awards luncheon. The award for the best paper from the technical sessions at the previous (66th) conference (held in Washington, DC) was presented to Aaron Pesetski, James Baumgardner, James Murduck, Erica Folk, John Przybysz, John Adam and Hong Zhang (Northrop Grumman Corporation) for their paper, "A Novel Measurement Technique for Demonstrating Carbon Nanotube FET Operation at Microwave Frequencies". The award for best poster paper was given to Haruichi Kanaya, Kenta Seki and Keiji Yoshida (Department of Electronics, Kyusu University, Japan), for their paper "Design of a Single Chip Antenna Combined with Coplanar Matching Circuit and Duplexer". The award for Best Exhibitor was presented to SUSS MicroTec.

Certificates of appreciation were also presented to the organizers of the 67th conference: Conference Chair, Ken Wong; Technical Program Chair, Mohamed Sayed; Conference Host, Bela Szendrenyi; the Technical Session Chairs, John Wood, Franco Sechi and Yves Rolain; and, the Interactive Forum Chair, John Wood, and co-Chair, David Blackham.

ARFTG President, Greg Burns (left), presents the Best Exhibitor award, from the previous (66th) conference, to Andrej Rumiantsev, of SUSS MicroTec

NVNA USERS' FORUM - INTERNATIONAL

The 'international' meeting of the NVNA Users' Forum was held on Thursday evening, June 15th, also at the Renaissance Parc 55 Hotel, San Francisco. A total of 40 people from industry, government and academia attended the meeting, 12 of which were attending for the first time. The meeting included two discussion topics; "What is the Importance of Modeling Memory Effects?" and "Uncertainties in Measurement-Based Models – is it Possible?" as well as a PhD research topic; "Covariance-Based Uncertainty Representation for Frequency- and Time-Domain Measurements". Research updates were also presented, including a briefing on "Avoiding Common Pitfalls when Going Beyond S-Parameters". The meeting also provided ample opportunity for informal discussions. A summary of this meeting will be available at www.arftg.org.

JOINT ARFTG/IMS WORKSHOPS

Two joint ARFTG/IMS workshops were held during Microwave Week 2006. Both workshops took place on Monday, June 12th, at the Moscone Convention Center, San Francisco. The first workshop, titled "High Speed Digital Signal Integrity", was organized by Tom Ruttan (Intel Corporation) and Mike Resso (Agilent Technologies). The second workshop, titled "Practical Methods for Determining the Accuracy of Measurements – a Review of Techniques Both Old and New", was organized by Nick Ridler (NPL), Bela Szendrenyi (Agilent Technologies) and Dennis Lewis (Boeing).

OTHER NEWS – SOME RECENT CHANGES

The ARFTG Executive Committee (ExCom) has recently introduced two changes to ARFTG. The first is the introduction of a new ARFTG logo (an example of which appears at the top of the first page of this newsletter). This logo will be used on all ARFTG communications (e.g. Call for Papers, brochures, website, etc). The second change is that paper copies of the digest accompanying the spring conferences will no longer be produced. This is due to the availability of the digest on the CD that also contains the IMS digest.

FUTURE EVENTS

NVNA Users' Forum – Europe

This meeting will be held during European Microwave Week 2006, which takes place from September 10th to 15th, 2006, in Manchester, UK. (Information on European Microwave Week is available at www.eumw2006.com.) The meeting is co-sponsored by the European Network of Excellence TARGET (www.target-net.org). The NVNA Users' Forum meeting is being held at 4:15 pm on Thursday September 14th. The agenda for the meeting will be available at www.arftg.org in due course. People wishing to be added to the e-mail distribution list should contact the Forum organizers: Dominique Schreurs (dominique.schreurs@esat.kuleuven.ac.be), Wendy Van Moer (wendy.vanmoer@vub.ac.be) and Kate Remley (remley@boulder.nist.gov).

Fall 2006 ARFTG Symposium

The annual fall ARFTG Symposium comprises the Microwave Measurement Conference, the NIST/ARFTG Microwave Measurement Short Course, the Nonlinear Measurement Workshop and the NVNA Users' Forum. All these events will be held at the Omni Interlocken Resort, Broomfield, Colorado, from November 28th to December 1st, 2006. More information on these events is given below.

It is also likely that there will be an opportunity, during the symposium, to visit the NIST laboratories in nearby Boulder. These laboratories are responsible for developing, maintaining and disseminating primary national reference standards for measurements at RF, microwave and millimeter-wave frequencies. This is an opportunity not to be missed!

Microwave Measurement Conference

The 68th ARFTG Microwave Measurement Conference will be held on November 30th and December 1st. The conference theme is "Measurement for Emerging Technologies". As is usual, the conference will offer ample opportunity for participants to interact with leading professionals in fields such as RF telecommunications and other microwave technologies. For more information, visit www.arftg.org or contact the Conference Chair, Ronald Ginley (rginley@boulder.nist.gov), of NIST, or the Technical Program Chair, Tom Ruttan (thomas.g.ruttan@intel.com), of the Intel Corporation.

NIST/ARFTG Microwave Measurement Short Course

ARFTG, in cooperation with NIST, will offer its 13th annual Microwave Measurement Short Course on November 28th and 29th. This popular one-and-a-half day course provides both grounding in the fundamentals of microwave measurement as well as information on the latest developments in measurement techniques taught by the experts. Basic measurement techniques are covered on Day 1, including: VNA error models and calibration methods; on-wafer measurement; RF connectors and transmission lines; noise and power measurement. Related topics are covered on Day 2, for example: phase noise, uncertainty of measurement and large signal network analysis. For more information, visit www.arftg.org or contact the Short Course Director, Dave Walker (dwalker@boulder.nist.gov) of NIST.

The Omni Interlocken Resort, Broomfield, venue for the Fall 2006 ARFTG Symposium

Nonlinear Measurement Workshop

Many instruments used in nonlinear measurement are based on RF samplers, including oscilloscopes, LSNAs/MTAs, some VNAs and spectrum analyzers. This year's Nonlinear Measurement Workshop will discuss the advantages and weaknesses of high frequency sampling compared with traditional RF mixing for measurements, especially in the case of large signals. Along with highlights on up-to-date very fast sampling technologies, some more exotic techniques with surprising results and impressive capabilities will also be discussed.

The workshop will be held on Wednesday afternoon, November 29th. For more information, visit www.arftg.org or contact the workshop organizer, Jean-Pierre Teyssier (teyssier@brive.unilim.fr), IRCOM-CNRS, University of Limoges, France.

NVNA Users' Forum – US

This meeting will also take place on November 29th, right after the Nonlinear Measurement Workshop. More information will be available at www.arftg.org.

Spring 2007 ARFTG activities

The 69th ARFTG Microwave Measurement Conference will be held on June 8th, 2007, in Honolulu, Hawaii, as part of Microwave Week 2007, in conjunction with IMS (www.ims2007.org) and the RFIC symposium (www.rfic2007.org). The ARFTG conference theme is "Addressing Metrology Needs for Future High-Speed Information and Communication Systems". For more information, visit www.arftg.org or contact the Conference Chair, Dominique Schreurs (dominique.schreurs@esat.kuleuven.ac.be), of K U Leuven, Belgium, or, the Technical Program Chair, Uwe Arz (uwe.arz@ptb.de), of PTB, Germany.

It is also planned to hold a meeting of the NVNA Users' Forum – International, as part of the summer ARFTG 2007 activities, and to co-sponsor appropriate workshops and/or tutorials that will be taking place during Microwave Week 2007.

DIGESTS AND COURSE NOTES

Available for purchase are printed digests and course notes from this and previous conferences. Also the collected ARFTG digests for 1982-2001 conferences are for sale on CD-ROM. Additional information can be found at www.arftg.org or by contacting Jim Taylor (jtaylor@blitz-it.net), the ARFTG Executive Secretary.

CORRECTIONS

Every effort has been made to publish correct information in this newsletter. Significant errors should be reported to the ARFTG ExCom Secretary, Nick Ridler (nick.ridler@npl.co.uk), so that corrections can be reported in the next issue.