



AUTOMATIC RF TECHNIQUES GROUP

NEWSLETTER

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Fall 2011 ARFTG Microwave Measurement Symposium: High Power RF Measurement Techniques

OVERVIEW



*The Tempe Mission Palms Hotel, Tempe, Arizona,
venue for the Fall 2011 ARFTG Symposium*

The Fall 2011 ARFTG Microwave Measurement Symposium took place at the Tempe Mission Palms Hotel in Tempe, Arizona, over four days from Tuesday, November 29th, to Friday, December 2nd. Unlike in previous years, the first day was with the co-located IEEE Topical Symposium on Power Amplifiers. The remainder of the week consisted of a conference, a short course on power amplifier systems and a users' forum. The theme of this year's symposium was "High Power RF Measurement Techniques". The symposium 'main event' was the 78th ARFTG Microwave Measurement Conference, which took place on Thursday and Friday. In addition to these technical events, there was an awards banquet on Thursday evening and a vendor exhibition during the main conference. Taken together, this amounted to four days packed with exciting activities for RF, microwave, and millimeter-wave 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.

IEEE TOPICAL SYMPOSIUM ON POWER AMPLIFIERS

This year, the ARFTG symposium was co-located with the long-running IEEE Topical Symposium on Power Amplifiers in order to provide an environment where attendees could hear about many RF power and measurement topics in one place. With integrated themes and conference organization, a more seamless experience was possible for all. The power amplifier symposium was held on Tuesday, November 29th and had approximately 70 attendees.

Symposium Chair John Wood and Technical Program Chair Gayle Collins arranged a program of 16 papers. Three of the papers were invited and covered the topics of "PA design considerations for polar transmitters" (J. S. Kenney, Georgia Tech University, US), "Review and perspective of Doherty and out-phasing architectures" (E. Neo and L. De Vreede, Delft University of Technology, The Netherlands) and "Digital signals: Shannon, Ohm, and PA costs" (E. McCune, RF Communications Consulting, US). The topical symposium concluded with a banquet on Tuesday evening.

ADVANCED SHORT COURSE ON RF POWER AMPLIFIER SYSTEMS

A short course on system aspects of RF power amplifiers was organized by Steve Cripps and was held on Wednesday, November 30th after the Topical Symposium on Power Amplifiers. The short course contained talks on the following topics from renowned lecturers: Digital wireless communications signals (E. McCune), Harmonic loading for high efficiency PAs (S. Cripps), Doherty power amplifier design (D. Runton), Drain modulation for high efficiency PAs (P. Asbeck), and Linearization techniques for PAs (R. N. Braithwaite).

Over 50 people attended this event and thanks are due to all those that were involved in the organization of the short course.



The advanced short course on RF power amplifier systems helped continue the High Power Measurements theme of the symposium.

NVNA USERS' FORUM - US

The ARFTG NVNA (Nonlinear Vector Network Analyzer) Users' Forum held a meeting on Wednesday afternoon, immediately after the power amplifier short course and was organized by Patrick Roblin. On this occasion, approximately 20 people attended this informal meeting that comprised brief technical presentations and an open discussion on NVNA round-robin verification (introduced by Dylan Williams of NIST).

CONFERENCE TECHNICAL SESSIONS

The 78th ARFTG Microwave Measurement Conference began on Thursday, December 1st with introductions by

ARFTG President Ron Ginley and the Conference Co-Chair, John Wood. The conference received sponsorship from several organizations:

Platinum sponsors: Anritsu and AWR/National Instruments

Gold sponsors: Agilent Technologies, Focus Microwaves, Freescale, Maury Microwave, and RFMD

Silver sponsors: HFE and Mesuro

For future sponsorship opportunities, contact the Sponsorship Chair, Joe Gering (sponsorship@arftg.org).

The conference consisted of seven sessions spread over the two days organized by Technical Program Chair, Peter Aaen. The first session began with an invited talk by Andrea Ferrero entitled "High power load-pull measurements: today's technologies and tomorrow's challenges." All papers have been published in the conference digest CD (copies of which can be ordered from www.arftg.org). On this occasion, about 70 people attended the conference.



Lively discussions with the audience after each technical session paper contributed to the conference experience.

The best oral paper presentation, as voted on by conference attendees, was "Interpolation and extrapolation capabilities of non-linear behavioural models" by R. S. Saini¹, J. W. Bell¹, T. Williams², J. Lees¹, J. Benedikt¹, and P. J. Tasker¹ (¹Cardiff University, Cardiff, UK; ²Mesuro Limited, Cardiff, UK). The best exhibitor was voted as Southwest Microwave.

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.



Extended breaks allowed for ample interaction between attendees and exhibitors.

The following companies chose to exhibit at this conference:

- Agilent Technologies
- Anritsu
- Constant Wave
- OML, Inc.
- Maury Microwave
- Rohde & Schwarz
- Southwest Microwave.

To exhibit at future conferences, please contact the ARFTG Exhibits Chair, Rusty Myers, at exhibits@arftg.org.

ANNUAL BUSINESS MEETING

The annual ARFTG Business Meeting was held on December 1st, 2010, during the 78th 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 three existing members of ExCom, Jon Martens, Rusty Myers, and Ken Wong; and the election of two new members: Peter Aaen and John Wood. ARFTG thanks Uwe Arz and Brett Grossman for their valuable contributions to ARFTG while members of ExCom.

CONFERENCE AWARDS

ARFTG President, Ron Ginley, presided over the conference awards ceremony, which took place during the awards banquet on Thursday evening. Certificates of appreciation were presented to the organizers of the

conference, namely: Mohamed Sayed and John Wood, Conference Co-Chairs; Mike Majerus, Conference Host; Peter Aaen, Technical Program Chair; Gayle Collins, Technical Program Chair of the Power Amplifier Symposium; Brett Grossman, Exhibits Chair; and the Session Chairs – Mohamed Sayed, John Wood, Robert L. Marks II, Gayle Collins, Sergio Pacheco, Nick Ridler and Jon Martens.

Awards were also given for best papers and exhibitors from the previous (77th) conference held in Baltimore, Maryland. The best oral paper presentation award went to “Uncertainty in multiport S-parameter measurements” by A. Ferrero¹, M. Garelli³, B. Grossman², S. Choon², and V. Tepatti¹ (¹Politecnico di Torino, Italy, ²Intel, United States, and ³HFE, Switzerland). The best interactive forum paper presentation award was a tie between “Contactless distance measurement method” by K. Hoffmann and Z. Skvor (Czech Technical University in Prague, Czech Republic) and “Real-time non-linear de-embedding” by F. Vanaverbeke¹, W. De Raedt¹, D. Schreurs² and M. Vanden Bossche³ (¹Imec, Belgium, ²K. U. Leuven, Belgium, and ³NMDG NV, Belgium). The best exhibitor award was a tie between LeCroy and Anritsu.

On a special note, Dr. James Rautio received the ARFTG Career Award in acknowledgement of his industry leading contributions to electromagnetic physical structure simulation and his persistent effort to match simulated to measured results.



ARFTG president Ron Ginley presenting the ARFTG Career Award to Dr. James Rautio

OTHER RECENT EVENTS:

NVNA USERS' FORUM - EUROPE

The NVNA Users' Forum – Europe meeting took place during European Microwave Week 2011 in Manchester, UK and drew over 20 attendees. An open discussion

was held on calibration and verification and the types of NVNA verification artifacts that would be the most useful. A new toolbox for handling large signal and small signal measurements was also discussed.

FUTURE EVENTS

Summer 2012 ARFTG activities

Microwave Measurement Conference

The 79th ARFTG Microwave Measurement Conference will be held on June 22nd, 2012, in Montreal, Canada, as part of Microwave Week 2012 (June 17th-22nd), which also includes the IEEE MTT-S International Microwave Symposium (www.ims2012.org), the Radio Frequency Integrated Circuits symposium (www.rfic2012.org) and workshops. The theme for the ARFTG conference is "Nonlinear Measurement Systems". For more information, contact the Conference Chair, Dominique Schreurs, (Dominique.Schreurs@esat.kuleuven.be), or the Technical Program Chair, Jean-Pierre Teyssier, (teyssier@brive.unilim.fr) or visit www.arftg.org. ARFTG will be co-sponsoring two workshops during Microwave Week.

NVNA Users' Forum

The ARFTG NVNA Users' Forum will also hold a meeting during Microwave Week 2012. For more information, please contact the Forum organizer Patrick Roblin (roblin@ece.osu.edu).



Palais des Congrès de Montréal, site for the 79th ARFTG Microwave Measurement Conference

Student Design Competition

ARFTG and the NVNA Users' Forum are supporting a measurement design competition at IMS2012 entitled "Development of a Large-Signal-Network-Analyzer Round-Robin Artifact." Interested students are encouraged to participate. For more information, see www.ims2012.org or contact Rashaunda Henderson (rmh072000@utdallas.edu). The entry deadline is

March 31, 2012 with the actual measurements/judging to occur at IMS on June 20, 2012.

NVNA Users' Forum - Europe

It is planned to hold a meeting of the ARFTG NVNA Users' Forum during European Microwave Week 2012, which takes place from October 28th- November 2nd in Amsterdam, The Netherlands. More information on European Microwave Week 2012 can be found at www.eumweek.com. More information is also available from the forum organizer Jean-Pierre Teyssier (teyssier@brive.unilim.fr).

Fall 2012 ARFTG Symposium

The Fall 2012 ARFTG Microwave Measurement Symposium will be held in San Diego, California, from Tuesday, November 27th, to Friday, November 30th. It is planned to hold the 80th ARFTG Microwave Measurement Conference, a workshop and the NVNA Users' Forum during this symposium. This meeting will represent 40 years of ARFTG and special events are being planned. The conference theme is "Advances in Wireless Communications Test & Measurement." For more information, contact the Conference Chair, Rusty Myers (rmyers@maurymw.com) or the Technical Program Chair, Ali Boudiaf (aboudiaf@maurymw.com). Information will also be available, in due course, at www.arftg.org.

ARFTG AND SOCIAL MEDIA

The ARFTG group on LinkedIn now has over 400 members. This is a good place to get reminders of upcoming meetings and is an opportunity for discussion with others interested in ARFTG. To join: become a LinkedIn member, search for ARFTG in the groups list, and submit a membership request.

ARFTG FELLOWSHIP PROGRAM

ARFTG can award one or more fellowships each year to students working in RF/microwave measurement-related topics. This year, three fellowships were awarded to well-qualified applicants: Xi Luo (Lehigh University), Evelyn Benabe (University of South Florida) and Vikas Shilimkar (Oregon State University). The application instructions and criteria for award are published at www.arftg.org.

ADDENDUM

Every effort has been made to publish correct information in this newsletter. Significant errors should be reported to the ARFTG Executive Committee Secretary, Jon Martens (jmartens@ieee.org), so that corrections can be reported in the next issue.