

MORNING SESSIONS  8:30 AM-NOON

FRIDAY INCLUDES:*

Workshops/Tutorials

- Leadership Skills
- Application of Time Domain Measurements for Test Site Validation and Antenna Calibration
- EMC Society History
- Fundamentals of Signal Integrity
- Emissions and Immunity Near Field Scanning Techniques
- Basic EMC Measurements
- Capturing the Electromagnetic Environment
- Electromagnetic Field Coupling with Transmission Lines, from Classical Theory to Recent Enhancements
- Practical Tips on 17025 Compliance

Other Events

- iNARTE Certification Examination (Page 56)

Tours

- Vizcaya Museum and Gardens (Page 62)

Leadership Skills

FR-AM-1 | Full-day Tutorial | Room 223/222

Chair: Kimball Williams, Past President IEEE EMC Society, Denso International America Inc., Michigan, U.S.A.

Co-chair: Elya B. Joffe, Immediate Past President IEEE EMC Society, Israel

Abstract

Sufficient training in the soft skills is often lacking in the curricula of engineers. The industry approach of sink or swim can be harsh. This tutorial will provide opportunities to learn or brush up on critical communications and business skills necessary for career success as an engineer in today's market.

Planned Speakers and Topics

1. **Introduction to Leadership** [8:30-9:30]
Elya Joffe, Immediate Past President IEEE EMC Society, Israel
2. **Networking Skills** [9:30-10]
Dan Hoolihan, Hoolihan EMC Consulting, Minnesota, U.S.A.
3. **Effective Presentations** [10:30-11:30]
Bruce Archambeault, IBM, North Carolina, U.S.A.
4. **Navigating Organizational Politics** [11:30-Noon]
Bob Hofmann, Hofmann EMC Engineering, Illinois, U.S.A.
5. **Code of Ethics** [1:30-2:30]
Elya Joffe, Israel
6. **Effective Meetings** [2:30-3:30]
John LaSalle, Northrop Grumman Corporation, New York, U.S.A.
7. **Effective Memos and Reports** [3:30-4:30]
Robert Scully, NASA Johnson Space Center, Texas, U.S.A.
8. **Designing a Career Path** [4:30-5:30]
Kimball Williams, Denso International America, Michigan, U.S.A.

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Application of Time Domain Measurements for Test Site Validation and Antenna Calibration

FR-AM-2 | Half-day Tutorial | Room 221/220

Chairs: Janet O'Neil & Dr. Vince Rodriguez, ETS-Lindgren, Texas, U.S.A.

Abstract

For some time now, the American National Standards Institute (ANSI) Accredited Subcommittee (ASC) C63® (Electromagnetic Compatibility) has had a working group tasked with developing new procedures for validating EMC radiated emission test sites above 1 GHz as well as performing antenna calibration. IEC/CISPR is addressing this topic as well as other associated topics such as measurement methods and test instrumentation in this frequency range. This tutorial is intended to bring a number of contributors together to detail the progress to date and look at options available for such EMC testing at higher frequencies in the future. This tutorial will provide an introduction to the validation and calibration techniques that are likely to be required in the near future, as well as discussion of the difficulties likely to be faced and

* All events are subject to change. Check www.emc2010.org and the Registration Area daily for updates.

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USA – Telecommunication Certification Body (TCB) for the FCC.

CANADA – Foreign Certification Body (FCB) for Industry Canada.

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MORNING SESSIONS  8:30 AM-NOON**Application of Time Domain Measurements for Test Site Validation and Antenna Calibration**

Continued from page 46

will include the status of associated test instrumentation and measurement methods above 1 GHz. The results of recent round robin testing comparing the CISPR VSWR and the ANSI time domain methods will be presented.

It is an ideal opportunity for attendees to obtain valuable information about upcoming requirements in an informal atmosphere. Presentations will address EUT test setup, selection of a test facility, test instrumentation, antennas, exercising of the EUT, and other challenges in product compliance testing above 1 GHz.

Topics to be addressed by the speakers include a comparison of intrinsic uncertainty of the CISPR VSWR method and the ANSI time domain method; antenna characteristics above 1 GHz, time domain techniques for antenna calibration, a review of antenna theory and the importance of pattern information; using ordinary EMC antenna types to perform high-resolution time-domain chamber evaluations; comparison of VSWR and TDR methods for chamber validation above 1 GHz; instrumentation usage and techniques for time domain measurements.

Planned Speakers and Topics

- 1. Comparison of VSWR and TDR Methods for Chamber Validation Above 1 GHz**
Tim O'Shea, Northwest EMC, Minnesota, U.S.A.
- 2. High-Resolution Propagation Measurements Using COTS EMC Antennas**
R.T. Johnk, J.D. Ewan, N. DeMinco, P. McKenna, Institute for Telecommunication Sciences, Colorado, U.S.A.
- 3. Antenna Characteristics Above 1 GHz, Review of Antenna Theory**
Vince Rodriguez, ETS-Lindgren, Texas, U.S.A.
- 4. Site Qualification Above 1 GHz and SVSWR Systemic Errors**
Mike Windler, Underwriters Laboratories, Illinois, U.S.A.
- 5. Measurement Considerations When Using a Vector Network Analyzer for Site Validation Above 1 GHz**
Jeff Poole, Agilent Technologies, California, U.S.A.

EMC Society History

FR-AM-3 | Half-day Tutorial | Room 209/210

Chair: Daniel D. Hoolihan, Hoolihan EMC Consulting, Minnesota, U.S.A.

Abstract

This tutorial will review the History of the EMC Society of the IEEE from the 1950s to the present time. It will review the growth of Radio Frequency Interference from the days of the Institute of Radio Engineers and the American Institute of Electrical Engineers to the present-day IEEE Organization.

The talks will cover the United States and Canada in one presentation, the European and associated geographical areas of Region 8, and the Asian history, especially Japan, of the IEEE as represented by Region 10 interests. Both the development of geographical-chapters and the proliferation of EMC Symposiums will be covered as well as key EMC people. The tutorial will close with a panel discussion with audience participation.

Planned Speakers and Topics

- 1. The History of the EMC Society in Regions 1-7**
Daniel D. Hoolihan, Hoolihan EMC Consulting, Minnesota, U.S.A.
- 2. The History of the EMC Society in Region 8**
Frank Sabath, Federal Armed Forces Research Institute, Salzhhausen, Germany
- 3. EMC Chapter Development History at Japan and in Region 10**
Takeo Yoshino, Professor Emeritus, University of Electro-Communications, Tokyo, Japan

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Fundamentals of Signal Integrity

FR-AM-4 | Half-day Tutorial | Room 207/208

Chair: Prof. Tzong-Lin Wu, National Taiwan University, Taiwan and Prof. Jun Fan, Missouri University of Science and Technology, Missouri, U.S.A.

Abstract

This tutorial will focus on fundamental modeling and design concept for signal/power integrity (SI/PI) in high-speed circuit systems. They include SI and jitter design, power distribution networks design and modeling, measurement method for SI. A case study of SI/PI design for the high-speed memory I/O circuits will be finally presented.

Planned Speakers and Topics

- 1. Signal Integrity Design and Jitter**
Jun Fan, Missouri University of Science and Technology, Missouri, U.S.A.

MORNING SESSIONS  8:30 AM-NOON

2. **Multi-Physics Analysis Methodology for Signal Integrity**
Lijun Jiang, Hong Kong University/IBM, Hong Kong/ U.S.A.
3. **A Case Study of SI/PI Design for High-Speed Memory I/O Circuits**
Tzong-Lin Wu, National Taiwan University, Taiwan

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2. **IC EMC Analysis Using Scanning**
Kevin Slattery, Intel, Oregon, U.S.A.
3. **Physical Foundations, Limits and Implementation of Mathematical Source Reconstruction**
Dr. Jun Fan, Missouri University of Science & Technology
4. **Investigation and Post-Processing on Near-Field Techniques**
Anne Louis, ESIGELEC, Saint Etienne du Rouvray, France

Emissions and Immunity Near Field Scanning Techniques

FR-AM-5 | Half-day Tutorial | Room 203/204

Chair: Kevin Slattery, Intel, Oregon, U.S.A.

Abstract

This tutorial will discuss the methodology and application of near field scanning techniques. These techniques allow to determine for the case of emissions the local field strengths and for immunity the local sensitivity of ICs, PCBs and modules. Thus, the techniques can be used as qualification and debugging tool and for creating models needed in numerical simulation. The workshop targets both novel and expert users. It will at first introduce the methodologies and discuss the applications and limits. The correlation of local scanning to system level behavior of systems will be in the foreground. Both mathematically based methods and methods based on engineering judgment will be discussed.

Near field techniques covered are:

- EMI near field scanning and possible data processing like source reconstruction
- Coupling path analysis for RFI problems (digital to wireless antenna)
- ESD and immunity near field scanning
- Resonance analysis using scanning
- IC-EMC analysis

Planned Speakers and Topics

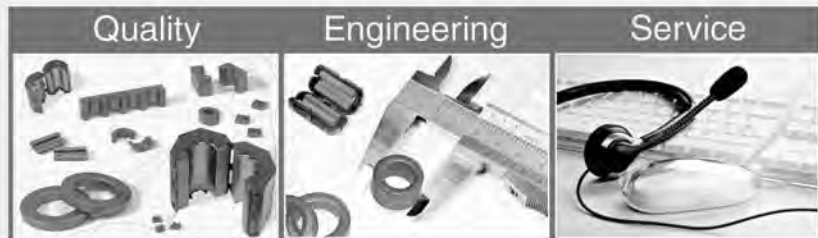
1. **Overview Talk on Scan Methodologies**
Keong Kam, Missouri University of Science & Technology

ON THE WEB

Get the latest information and updates before and during the 2010 IEEE EMC Society Symposium by visiting the *Interference Technology* Symposium Channel online at www.interferencetechnology.com.

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AFTERNOON SESSIONS  1:30 PM-5:30 PM

Leadership Skills

FR-PM-1 | Full-day Tutorial | Room 223/222

Chair: Kimball Williams, Past President IEEE EMC Society, Denso International America, Michigan, U.S.A.
Co-chair: Elya B. Joffe, Immediate Past President IEEE EMC Society, Israel

Abstract

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Robert Scully, NASA Johnson Space Center, Texas, U.S.A.
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Kimball Williams, Denso International America, Michigan, U.S.A.

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Basic EMC Measurements

FR-PM-2 | Half-day Tutorial | Room 221/220

Chair: Don Heirman, Don HEIRMAN Consultants, New Jersey, U.S.A.

Abstract

This tutorial will be an introduction to basic EMC measurements with primary focus on emission testing. While intended for those new to these disciplines, the latest activity in national and international standards related to EMC measurements and standards will be presented. A special

focus will be on measurements and associated issues above 1 GHz as well as measurement uncertainty. An open discussion will follow the presentations.

Planned Speakers and Topics

1. **Emission Measurements for Tabletop Equipment** [1:35-2]
Steve Koster, Washington Labs, Maryland, U.S.A.
2. **Emission Measurements for Floor-Standing Equipment** [2-2:30]
Bob Hofmann, Hofmann EMC Engineering, Illinois, U.S.A.
3. **IEC Transient Immunity Testing Overview** [2:30-3]
Tom Braxton, Braxton EMC Consulting, Illinois, U.S.A.
4. **Immunity to Continuous RF Disturbances** [3:30-4]
John Maas, IBM, Minnesota, U.S.A.
5. **Basic Measurement Sites, Methods, and Associated Errors** [4-4:30]
Don Heirman, Don HEIRMAN Consultants, New Jersey, U.S.A.
6. **Selecting a Quality EMC Lab** [4:30-5]
Dan Hoolihan, Hoolihan EMC Consulting, Minnesota, U.S.A.
7. **Uncertainty Considerations in Stating Pass/Fail** [5-5:15]
Don Heirman, Don HEIRMAN Consultants, New Jersey, U.S.A.
8. **Questions and Answers** [5:15-5:30]
Panel discussion.

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Capturing the Electromagnetic Environment

FR-PM-3 | Half-day Tutorial | Room 209/210

Chairs: Dr. Randy Jost, Space Dynamics Laboratory, Utah, U.S.A.

David Southworth, SPAWAR Systems Center Pacific, California, U.S.A.

Abstract

This tutorial is intended to discuss the current state of knowledge for electromagnetic environments (EME) and how EME is measured. The EME is evolving and expanding into areas previously considered "RF quiet" with the proliferation of wireless electronics. Industrial and military EME will be discussed as well as soliciting arenas that may not yet be assessed, but play a role in the future. Electromagnetic environments can affect the operation of electronic

AFTERNOON SESSIONS 1:30 PM-5:30 PM

systems or equipment with unintended consequences. The design of equipment must take the EME into account and thus the EME must be known. The audience will be encouraged to continue the dialogue on measuring and defining the expanding and unique EME in TC-3 technical meetings and future TC-3 EME workshops.

Planned Speakers and Topics

1. **A Primer on EME, What Is It, Really?**
Dr. Randy Jost, Space Dynamics Laboratory, Utah, U.S.A.
2. **Overview of IEEE/Standard 473**
Dave Southworth, SSC-Pacific, California, U.S.A.
3. **Amplitude Probability Distribution (APD) Measurement in Industrial Environments**
Dr. José Chilo, University Senior Lecturer, University of Gävle ITB/Electronics, Sweden

Sponsored by TC3

Electromagnetic Field Coupling with Transmission Lines, from Classical Theory to Recent Enhancements

FR-PM-4 | Half-day Tutorial | Room 207/208

Chair: Farhad Rachidi, Swiss Federal Institute of Technology (EPFL), Lausanne, Switzerland
Co-chair: Marcos Rubinstein, University of Applied Sciences, Switzerland

Abstract

The evaluation of electromagnetic field coupling to transmission lines is an important problem in electromagnetic compatibility. Customarily, use is made of the transmission line (TL) approximation which applies to uniform transmission lines with electrically small cross-sectional dimensions, where the dominant mode of propagation is transverse electromagnetic (TEM). Antenna-mode currents and higher order modes appearing at higher frequencies are neglected in the classical TL theory.

Since the development of the TL theory and the derivation of the so-called telegrapher's equations, significant progress has been achieved in the understanding of wave propagation a long transmission lines. In 1965, Taylor, Satterwhite and Harrison extended the classical TL equations to include the presence of an external electromagnetic field. Their field-to-transmission coupling equations - as well as their equivalent formulations derived later - have been successfully applied to solve a large range of problems dealing with EMP and lightning interaction with power and telecommunication lines.

The emergence of sources of disturbances with higher

frequency content (such as High Power Microwave and Ultra-Wide Band systems) have led to a breakdown of the TL approximation's basic assumptions for a number of applications. In the last decade or so, the generalization of the TL theory to take into account high frequency effects has emerged as an important topic of study in electromagnetic compatibility. This effort resulted in the elaboration of the so-called 'full-wave' TL theory, which incorporates high frequency radiation effects, while keeping the relative simplicity of TL equations.

This tutorial covers both the classical transmission line theory as well as its recent enhancements.

Planned Speakers and Topics

1. **Derivation of Telegrapher's Equations and Field-to-Transmission Line Interaction**
By Carlo Alberto Nucci, Farhad Rachidi, and Marcos Rubinstein|
Presented by Prof. Marcos Rubinstein, University of Applied Sciences, Yverdon, Switzerland
2. **Electromagnetic Field Coupling with Transmission Lines: Recent Enhancements**
By Sergei Tkachenko and Farhad Rachidi
Presented by Prof. Farhad Rachidi, Swiss Federal Institute of Technology (EPFL), Lausanne, Switzerland

Sponsored by TC5

Practical Tips on 17025 Compliance

FR-PM-5 | Half-day Tutorial | Room 203/204

Chair: Doug Kramer, Nebraska Center for Excellence in Electronics, Nebraska

Abstract

Brief background and review of ISO17025 and practical guidance on compliance. This tutorial will focus on the practical side.

Planned Speakers and Topics

1. **Brief Introduction to ISO 17025**
Dan Hoolihan, Hoolihan EMC Consulting, Minnesota, U.S.A.
2. **Common Deficiencies in EMC Laboratories**
Brad Moore, NIST /NVLAP, and Adam Gouker, A2LA
3. **Practical Tips on 17025 Compliance**
Doug Kramer, Nebraska Center for Excellence in Electronics, Nebraska, U.S.A.
4. **Paperless Implementation of a 17025 Quality System**
Derek Walton, LF Research, Illinois, U.S.A.

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