

2008 IEEE EMC SYMPOSIUM WORKSHOPS & TUTORIALS

MONDAY, 18 AUGUST 2008

(Events held at COBO Center unless otherwise noted.)

8:30 AM
TO
12:00 PM

MO-AM-1 Room W2-65
Introduction to EMI Modeling
Techniques
Chair: Charles Bunting

This workshop will provide an introduction to all of the commonly used numerical EMC modeling techniques. It is intended to provide EMC engineers who are interested in learning the basics of these modeling techniques a fundamental understanding of all the different techniques, without the need for detailed math. Practicing modelers will also benefit from learning the fundamentals of modeling techniques they are currently not using. Each technique will be presented along with their strengths and weakness, so engineers can decide which techniques are appropriate for their types of problems.

MO-AM-1-1
The Transmission Line Method
David P. Johns, CST of America

MO-AM-1-2
Introduction to the Partial Element
Equivalent Circuit Technique
*G. Antonini, UAq EMC Laboratory,
University of L'Aquila, Italy*

MO-AM-1-3
Introduction to the Finite-Difference
Time-Domain (FDTD) Technique
Sam Connor, IBM

MO-AM-1-4
Introduction to the Finite Element
Method
*Charles Bunting, Oklahoma State
University*

MO-AM-1-5
Integral Equation Methods (MOM) in
Numerical Modeling
*Ji Chen, University of Houston, and
and Jim Drewniak, Missouri
University of Science and Technology*

MO-AM-2 Room W2-67
Guide to Accreditation of EMC
Laboratories in the US
Chair: Werner Schaefer, Cisco Systems

The workshop is planned as a true exchange of information between laboratory personnel who are either considering to seek accreditation for their laboratory or who are already accredited. A formal outline of the workshop is prepared and can be followed. However, emphasis is placed on answering questions from the audience to ensure that the true interests of attendees are covered. The author, a lead assessor with A2LA, also manages the quality system for accredited laboratories and is actively participating in and contributing to national and international EMC and Quality standards work. The presenter's extensive background knowledge about RF and microwave test instrumentation allows for an in-depth discussion of complex subjects as suitability of test equipment calibration services, test equipment suitability and measurement uncertainty calculations.

Werner Schaefer, Cisco Systems

MO-AM-3 Room W2-63
Automotive EMC High Power and
Field Level Immunity Testing
*Chairs: Vince Rodriguez and Janet
O'Neil, ETS-Lindgren*

The workshop will present an overview of immunity testing, concentrating on the ISO 11451-2 standard for full vehicle as well as the ISO 11452-2 standard for vehicle components. The issues of generating and measuring high field levels will be addressed as well as selection criteria for the antennas, amplifiers and field probes used during high power testing. The test environment of an anechoic chamber and reverberation chamber will be reviewed (the reverberation chamber is also an approved approach for immunity testing) with an overview of performing a test in these environments. Finally, the impact of this high power testing on OEMs will be addressed by a representative from one of the "Big Three" automotive companies in the greater Detroit area.

MO-AM-3-1
Automotive RF Immunity Testing
OEM Perspective
Keith Fraser, Ford Motor Company

MO-AM-3-2
Test Instrumentation Considerations
for Automotive EMC High Power and
Field Level Immunity Testing
*Hans-Peter Bauer, Rohde and
Schwarz*

MO-AM-3-3
Generation and Measurement of
High Field Levels for Automotive
EMC High Power and Field Level
Immunity Testing
Vince Rodriguez, ETS-Lindgren

MO-AM-3-4
Test Environment Considerations for
Automotive EMC High Power and
Field Level Immunity Testing
Garth D'Abreu, ETS-Lindgren

12:00 PM LUNCH ON YOUR OWN

2008 IEEE EMC SYMPOSIUM WORKSHOPS & TUTORIALS

(Events held at COBO Center unless otherwise noted.)

18 AUGUST 2008, MONDAY

MO-AM-4 Room W2-64
Basic Antenna & Probe Use in EMC

Chair: Candace Suriano, PhD, Suriano Solutions

This workshop will provide an introduction to antenna and probe theory and application relevant to EMC. It will address fundamental principles of operation for various common antenna and field probe configurations covering the frequency spectrum associated with EMC testing.

Introduction
Candace Suriano, Suriano Solutions

MO-AM-4-1
Fundamentals of Antennas and Probes

Zhong Chen, ETS-Lindgren

MO-AM-4-2
Understanding Basic Techniques of Near Field/Far Field Analysis

Qin Yu, Alcatel-Lucent

MO-AM-4-3
Understanding Measurement and Noise Figure in EMC

Tom Holmes, Agilent Technologies

MO-AM-4-4

MO-AM-4-5
Antennas, Ferrites and Coax

Paul Zdanowicz, Fair-Rite Products Corp

MO-AM-5 Room W3-45/46
Fundamentals of EMC Part 1

Chair: Daryl Beetner, Missouri University of Science and Technology

Organized by the EMC Society Education and Student Activities Committee, this tutorial is designed to present the basics of EMC to those who are new to the field of EMC, those who are seeking information on an aspect of EMC that they have not previously encountered, or those who desire a refresher on the proposed EMC topics.

8:30am to 8:35am, MO-AM-5-1

Introduction
Daryl Beetner, Missouri University of Science and Technology

8:35am to 10:00am, MO-AM-5-2
Current, If Not Obstructed, Will Always Flow In The "Path Of Least..."

Elya Joffe, K.T.M. Project Engineering, Hod Hasharon, Israel

10:00am to 10:30am
 Break

10:30am to 12:00pm, MO-AM-5-3
Inductance and Capacitance in Electrical System Design

Daryl Beetner, Missouri University of Science and Technology

MO-AM-6 Room W2-62
EMC and Wireless Devices Part 1

Chair: Dan Hoolihan, Hoolihan EMC Consulting

This workshop will provide key information on EMC concerns as they pertain to present and future wireless/cellular phone technologies and associated packaging issues.

The first part of this workshop will introduce and define the concept of Platform and Cellular Device RF/Microwave Interference. It will include presentations on the concept of RF/microwave EMI for wireless systems including measurement techniques, design methodologies and case studies to establish risks and determine mitigation requirements for platform and device-generated RF/microwave EMI.

MO-AM-6-1
Radio Frequency Interference: The Problem and its Scope

Harry Skinner, Intel Corporation

MO-AM-6-2
Structure of RFI Source Signals

Kevin Slattery, Intel Corporation

MO-AM-6-3
Software Defined Radio and Cognitive Radio Techniques

David A. Case NCE,NCT, Cisco

MO-AM-6-4
Dynamic Frequency Selection

David W. Bare, Elliot Laboratories, Inc.

8:30 AM
 TO
 12:00 PM



LUNCH ON YOUR OWN 12:00 PM

2008 IEEE EMC SYMPOSIUM WORKSHOPS & TUTORIALS

MONDAY, 18 AUGUST 2008

(Events held at COBO Center unless otherwise noted.)

1:30 PM TO 5:30 PM	MO-PM-1 Room W2-63	MO-PM-2 Room W2-65	MO-PM-3 Room W2-64
	Limitations of Simulation Techniques and Proper Model Validation for Both Signal Integrity and EMC <i>Chair: Dr. Bruce Archambeault, IBM</i>	Basic EMC Measurements <i>Chair: Don Heirman, Don HEIRMAN Consultants</i>	Advanced Topics for Antennas and Field Probes in Radiated Measurements <i>Chairs: Zhong Chen and Janet O'Neil, ETS-Lindgren</i>
	<p>As signal speeds increase into the Gbit/sec range, the use of modeling and simulation is more important than ever before and has become quite common in real-world product design. However, using the right tool for the right job has become critical, since all simulation techniques have limitations. This workshop will include a number of experts in different modeling and validation techniques. Each speaker will provide a presentation concerning different modeling techniques, their practical limitations and how to validate simulation results.</p>	<p>This tutorial will provide an introduction to basic EMC measurements with a 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.</p>	<p>This tutorial covers antenna and probe theory with a focus on advanced application specific topics relevant to EMC. It will address aspects of applications of antennas and field probes beyond those specified in typical manufacturer's data sheets. The discussions are concentrated on the usage of antennas and probes in testing to EMC industry standards. This tutorial will also provide the latest updates on ANSI and CISPR standards on antenna calibrations, and IEEE 1309 and IEC 61000-4-3 standards on probe calibrations.</p>
	MO-PM-1-1 Introduction to the Limitations of Modeling/Simulation Techniques <i>Bruce Archambeault and Sam Connor, IBM</i>	MO-PM-2-1 Emission Measurements for Tabletop Equipment <i>Steve Koster, Washington Laboratories, Ltd.</i>	MO-PM-3-1 Half Power Beamwidth and High Power Measurements: The Dangers of Using Far Field Approximations in the Far Field <i>Vince Rodriguez, ETS-Lindgren</i>
	MO-PM-1-2 Evaluation of Antenna Effective Length using MOM: Closing the Gap with Validation <i>Bob Johnk, Institute for Telecommunication Sciences</i>	MO-PM-2-2 Emission Measurements for Floor Standing Equipment <i>Bob Hofmann, Hofmann EMC Engineering</i>	MO-PM-3-2 Time-Domain Analysis of Antennas used for EMC <i>Dennis Camell, NIST</i>
	MO-PM-1-3 FIT Numerical Modeling for EMI Discovery and "Design" <i>Jim Drewniak, Missouri University of Science and Technology</i>	MO-PM-2-3 IEC Transient-Immunity Testing Immunity <i>Thomas E. Braxton, Shure Incorporated</i>	MO-PM-3-3 Site Validation Above One GHz <i>Alexander Kriz, Austrian Research Center</i>
	MO-PM-1-4 Method of Moments, Use, Validation and Limitations <i>Colin E. Brench, Southwest Research Institute</i>	MO-PM-2-4 Immunity to Continuous RF Disturbances <i>John Maas, IBM</i>	MO-PM-3-4 Practical Topics on Field Probes – Advanced <i>Zhong Chen, ETS-Lindgren</i>
	MO-PM-1-5 Computational EM Applied to System Level Problems <i>Charles Bunting, Oklahoma State University</i>	MO-PM-2-5 Basic Measurement Sites, Methods and Associated Errors <i>Don Heirman, Don HEIRMAN Consultants</i>	MO-PM-3-5 Update for Antenna/Probe Standards and Applications <i>Michael J. Windler, Underwriters Laboratories, Inc.</i>
	MO-PM-1-6 Modeling and Measuring: Bridging the Great Schism in Engineering Electromagnetics <i>Vince Rodriguez, ETS-Lindgren</i>	MO-PM-2-6 Selecting a Quality EMC Lab <i>Daniel D. Hoolihan, Hoolihan EMC Consulting</i> MO-PM-2-7 Uncertainty Considerations in Stating Pass/Fail <i>Don Heirman, Don HEIRMAN Consultants</i>	

2008 IEEE EMC SYMPOSIUM WORKSHOPS & TUTORIALS

(Events held at COBO Center unless otherwise noted.)

18 AUGUST 2008, MONDAY

MO-PM-4 Room W2-67
iNARTE Exam Preparation

Chair: Brian Lawrence, iNARTE

The iNARTE Examinations Preparation Tutorial is recommended for all who plan to take the NARTE Certification Examinations on August 22 at the conclusion of EMC 2008, and will also be of value to those who plan to attend The Global EMC University and who will want to later validate their new-found credentials. At the tutorial, we will advise attendees as to the format of the two part examinations, we will discuss the best approach to ensure success and will provide some working examples of typical exam questions.

MO-PM-5 Room W3-45/46
Fundamentals of EMC continued

Chair: Daryl Beetner, Missouri University of Science and Technology

Organized by the EMC Society Education and Student Activities Committee, this tutorial is designed to present the basics of EMC to those who are new to the field of EMC, those who are seeking information on an aspect of EMC that they have not previously encountered, or those who desire a refresher on the proposed EMC topics.

1:30pm to 3:00pm, MO-PM-5-4
What is "Partial Inductance"?
Clayton Paul, Mercer University

3:00pm to 3:30pm
Break

3:30pm to 5:00pm, MO-PM-5-5
Automotive EMC
Todd Hubing, Clemson University

MO-PM-6 Room W2-62
EMC and Wireless Devices Part 2

Chair: Dan Hoolihan, Hoolihan Consulting

This workshop will provide key information on EMC concerns as they pertain to present and future wireless/cellular phone technologies and associated packaging issues.

The second part of this workshop will address specific device issues particularly as they relate to radiated electromagnetic interference and immunity for modern communications systems including cell devices, as well as the impact of new communications device technologies and dynamic frequency selection. Additional specific case studies will be presented along with a focus on selected wireless technology, packaging considerations, spectrum and laboratory measurement methods.

MO-PM-6-5
EMC and Wireless in the Test Lab
Mike Violette

MO-PM-6-6
Radio Frequency Interference
Kevin Slattery, Intel Corporation

MO-PM-6-7
Evaluating Impact of RFI on WLAN and WWAN Performance
Harry Skinner, Intel Corporation

MO-PM-6-8
Transmission Hyperspace: An Approach for Efficient and Interference-Free Spectrum Management for Diverse Radio Systems and Cellular Telecommunications Equipment
Andy Drozd, ANDRO Computational Solutions, LLC

MO-PM-6-9
Wireless Interference and Hearing Aids
Stephen Berger, TEM Consulting

1:30 PM
TO
5:30 PM



2008 IEEE EMC SYMPOSIUM WORKSHOPS & TUTORIALS

FRIDAY, 22 AUGUST 2008

(Events held at COBO Center unless otherwise noted.)

8:30 AM
TO
12:00 PM

FR-AM-1 Room W2-67

EMC and Modern Power Electronic Systems

Chair: Dr. Firuz Zare, Queensland University of Technology

The purpose of this tutorial is to address basic and advanced concepts of EMC in modern power electronic systems, which help EMC experts analyze EMC problems of power electronics used in different applications. Introducing power electronics in details such as transformer and motor design, modulation strategy, and switching losses to EMC experts may open a new research area and help development engineers to find better solutions to minimize sources of EMI noise at the development phase and improve cost, size and performance of the system.

FR-AM-1-1
Introduction
Firuz Zare, Queensland University of Technology

FR-AM-1-2
Ideal and Real Switches
Firuz Zare, Queensland University of Technology

FR-AM-1-3
DC-AC Converters
Firuz Zare, Queensland University of Technology

FR-AM-1-4
DC-DC Converters
Firuz Zare, Queensland University of Technology

FR-AM-1-5
Multilevel Converters
Firuz Zare, Queensland University of Technology

FR-AM-1-6
Current Loops
Firuz Zare, Queensland University of Technology

FR-AM-2 Room W2-65

Fundamentals of Signal Integrity

Chairs: Prof. Tzong-Lin Wu, National Taiwan University, Taiwan; and Prof. James Drewniak, Missouri University of Science and Technology, USA

This tutorial will introduce the audience to the fundamental concepts of signal and power integrity for high-speed digital boards or packages and in particular the topics of High-speed Signal Link Path, SI/PI Modeling and Analysis, Jitter, Power Distribution Networks, Models of Active Devices, and Measurement for SI. The focus will be on the fundamental modeling and design concepts of signal and power integrity (SI and PI) for highspeed circuit systems.

FR-AM-2-1
Block-by-Block Link-Path Analysis and Design with Physics-Based Models
Jim Drewniak, Missouri University of Science and Technology

FR-AM-2-2
Jitter
David Pommerenke, Missouri University of Science & Technology

FR-AM-2-3
Measurements for Signal Integrity
Vittorio Ricchiuti, Technolabs S.p.A., L'Aquila Italy

FR-AM-2-4
Power Distribution Networks
Tzong-Lin Wu, National Taiwan University, Taiwan

FR-AM-3 Room W2-64

Aerospace Lightning Protections

Chair: Fred Heather, JSF JPO EEE Lead

This tutorial will cover the area of lightning protection of aerospace vehicles. The tutorial will open with an introduction to lightning attachment to aircraft, and expand to address space vehicles and charge control. The tutorial will examine the indirect effects of modeling using TLM, complemented by the pitfalls and success of equipment level lightning testing, then conclude with a look at the direct effects of lightning to materials.

FR-AM-3-1
Aerospace Lightning Protections
Fred Heather, JSF JPO EEE Lead

FR-AM-3-2
Introduction to Aircraft Lightning Attachment
Anders Larsson, Swedish Defence Research Agency (FOI), Sweden

FR-AM-3-3
Lightning Protection for Space Vehicles
Robert Scully, NASA, USA

FR-AM-3-4
Indirect Effect Modeling using TLM
Neal Kiley

FR-AM-3-5
Pitfall and Success of Do-160 Lightning Testing
Andy Plumer, Lightning Technologies, Inc.

FR-AM-3-6
Direct Effects to Materials
Diane Heidlebaugh, Boeing Company



12:00 PM LUNCH ON YOUR OWN

2008 IEEE EMC SYMPOSIUM WORKSHOPS & TUTORIALS

(Events held at COBO Center unless otherwise noted.)

22 AUGUST 2008, FRIDAY

FR-AM-4 Room W2-63
Basic to Advanced EMI Failure Analysis

Chair: Dr. David Pommerenke, Missouri University of Science and Technology

This tutorial will help EMI engineers better understand and select a variety of methods for analyzing EMI failures in systems. The foundation of the methods will be explained and typical applications shown. The methodologies span from simple, well known methods such as current clamp measurements to complex methods such as near field scanning or correlation analysis and spectrogram analysis for broadband signals and tough cases in which multiple sources and antennas radiate on the same frequency. The novelty of this workshop will lay in the advanced EMI analysis methods, such as correlation analysis, spectrogram methods, and using mode stirred chambers (i.e. metallized tent) for EMI debugging.

FR-AM-4-1
Probes for Diagnosing EMC Problems
Tom VanDoren, Missouri University of Science and Technology

FR-AM-4-2
Useful Tools and Tricks in EMI and ESD Analysis
Doug Smith, D.C. Smith Consultants

FR-AM-4-3
Advanced EMI Analysis Methods
David Pommerenke, Missouri University of Science and Technology

FR-AM-4-4
EMC Case Histories
Lee Hill, SILENT

FR-AM-5 Room W2-62
Automotive EMC Part 1

Chair: Todd Hubing, Clemson University

This workshop addresses EMC test and design issues of relevance to the automotive industry. It brings automotive EMC engineers from around the world together to provide updates on the many rapid changes in the automotive industry that affect automotive EMC.

The first half-day of this workshop will focus on new automotive EMC challenges and design tools and techniques for automotive engineers. This will include talks on the impact of new automotive technologies, new design criteria, and an overview of the latest modeling tools available.

FR-AM-5-1
Where we Stand Today with Automotive EMC Simulation
Steven Frei, Dortmund University of Technology

FR-AM-5-2
Using Component-Level Measurements to Determine System-Level Radiated Emissions
Todd Hubing, Clemson University

FR-AM-5-3
Automotive EMC Expert Software
Roman Jobava, EMCos Ltd.,

FR-AM-5-4
Automotive EMC Measurement Techniques Based on New Technologies and Vehicle Packaging
Scott Mee and Sreenivas Ranganathan, Johnson Controls

FR-AM-5-5
EMC Component and Vehicle Validation Considerations for Hybrid Electric Vehicles
Jody J. Nelson, Daimler

FR-AM-5-6
Overview of Component Level EMC Characteristics for HEV Application
Hiroki Funato and Liang Shao, Hitachi America, Ltd. R&D

FR-AM-6, Room W2-66
Module Level EMI Measurements and Estimation

Chairs: H. R. Hofmann (1) and Hiroshi YAMANE (2)

This workshop describes the technical measurement methods for measuring emissions from module products to determine emission levels. Included in the requirements are measurement methods and evaluation of emission levels. These methods measure the applying area for the emission of modules.

FR-AM-6-1
Introduction to VCCI Kit Module EMI Program
Akhisa Sakurai, IBM and VCCI

FR-AM-6-2
Magnetic Probe Method
Toshiki Shimasaki, NEC Engineering, Ltd.

FR-AM-6-3
Trend and Outline of the Estimation for Module Level EMI Measurements
Osami Wada, Kyoto University, Japan

FR-AM-6-4
The Workbench Faraday Cage
Lars Kanters

FR-AM-6-5
TEM Method
Terry North, Consultant

8:30 AM
TO
12:00 PM

LUNCH ON YOUR OWN 12:00 PM

2008 IEEE EMC SYMPOSIUM WORKSHOPS & TUTORIALS

FRIDAY, 22 AUGUST 2008

(Events held at COBO Center unless otherwise noted.)

1:30 PM TO 5:30 PM FR-PM-1 Room W2-63
The European EMC Directive 2004/108/EC: Conformance Requirements

Chair: Chris Marshman, York EMC Services Ltd, York UK

This tutorial addresses the conformance requirements placed on manufacturers for CE Marking products to the EMC Directive. Directive 2004/108/EC will have been in force for 12 months by August 2008. This allows the opportunity for a timely review of issues that have arisen and observations on its application to be presented.

FR-PM-1-1
 The European EMC Directive 2004/108/EC
Chris Marshman, York EMC Services Ltd, York UK

FR-PM-1-2
 The European EMC Directive 2004/108/EC: Information Requirements Application to Military Requirements
Brian Jones, EMC Consultant

FR-PM-1-3
 The European EMC Directive 2004/108/EC: Harmonised Standards
Brian Jones, EMC Consultant

FR-PM-1-4
 The Notified Bodies
Chris Marshman, York EMC Services Ltd, York UK

FR-PM-1-5
 The European EMC Directive 2004/108/EC: Fixed Installations
Brian Jones, EMC Consultant

FR-PM-1-6
 The European EMC Directive 2004/108/EC: Enforcement
Brian Jones, EMC Consultant

FR-PM-1-7
 Summary for Conformity Assessment for Apparatus (CE Marking)
Chris Marshman, York EMC Services Ltd, York UK

FR-PM-1-8
 The European EMC Directive 2004/108/EC — Conformance Requirements
Chris Marshman and A. C. Marvin, York EMC Services Ltd and University of York, York UK

FR-PM-2 Room W2-67
The State of Electromagnetic Environments (EME)

Chair: Dave Southworth, SPAWAR Systems Center, California

This workshop will discuss the current state of knowledge for electromagnetic environments (EME). With the proliferation of wireless electronics, EME is evolving and expanding into areas previously considered "RF quiet". Major electromagnetic environments will be discussed as well as soliciting arenas that may not yet be assessed, but play a role in the future. The intent is to involve the audience prior to, during, and after the symposium. The session is soliciting data from participants on their local urban or operational EME. Please send your data to strauss_jeff@verizon.net. The data will be presented and discussed during this session.

FR-PM-3 Room W2-65
Practical EMI Filter Design

Chair: Alexander Gerfer, Würth Electronics-Midcom Inc.

The workshop targets a practical approach to design rules for the designer who must accommodate EMI-filters. New simulation tools and improved simulation models will be reviewed to help find the best filter solution for a given noise problem. A practical filter measurement of different filter topologies will show how the filter reaction is on a practical PCB-board.

FR-PM-3-1
 Practical EMI Filter Design
Dipl. Ing. (FH) Alexander Gerfer and Dipl. Ing. Michael Eckert, Würth Electronics-Midcom Inc.



2008 IEEE EMC SYMPOSIUM WORKSHOPS & TUTORIALS

(Events held at COBO Center unless otherwise noted.)

22 AUGUST 2008, FRIDAY

<p>FR-PM-4 Room W2-64 Aircraft EMP Hardening Specifications and Measurement Methods <i>Chair: William D. Prather, Air Force Research Laboratory, Directed Energy Directorate</i></p> <p>This tutorial will address the approach to writing specifications for electromagnetic shields, especially electromagnetically shielded aircraft which require a different approach than that taken with a ground-based screen room or armored vehicle. The electromagnetic shielding specifications can be written in measurable engineering units, and if this is done correctly, the shield performance may be measured in an unambiguous fashion during design, verification, and subsequent maintenance.</p> <p>FR-PM-4-1 Introduction <i>William D. Prather, Air Force Research Laboratory, Directed Energy Directorate</i></p> <p>FR-PM-4-2 High Altitude EMP Generation <i>William A. Radasky, Metatech Corporation, Goleta</i></p> <p>FR-PM-4-3 Coupling to Aircraft & Aircraft Hardening <i>William D. Prather, Air Force Research Laboratory, Directed Energy Directorate</i></p> <p>FR-PM-4-4 Apertures and Line Penetrations <i>William D. Prather, Air Force Research Laboratory, Directed Energy Directorate</i></p>	<p>FR-PM-5 Room W2-62 Automotive EMC Part 2 <i>Chair: Todd Hubing, Clemson University</i></p> <p>This workshop addresses EMC test and design issues of relevance to the automotive industry. It brings automotive EMC engineers from around the world together to provide updates on the many rapid changes in the automotive industry that affect automotive EMC.</p> <p>The second half-day of this workshop focuses on automotive EMC test practices. It will address the automotive industry's problems associated with out-dated, OEM-specific EMC test procedures and the challenge of trying to use component-level test results to anticipate system-level EMC problems.</p> <p><i>See Part 1 (FR-AM-5) for Topics and Presenters.</i></p>	<p>FR-PM-6 Room W2-66 Carbon Nanotube Technology for Next-Generation Nanointerconnects <i>Chair: Prof. Maria Sabrina Sarto</i></p> <p>This tutorial will present and discuss the internationally most advanced "state of the art" in the field of next-generation nano-interconnects based on carbon nanotube technology. The tutorial will introduce the challenges of ITRS-2007 as regards to nano-interconnects, the fundamental concepts concerning carbon nanotubes, and the advanced modeling tools of carbon-nanotube nanointerconnects both in the frequency and in the time-domain.</p> <p>FR-PM-6-1 Introduction to Carbon Nanotube Technology for Next Generation Nanointerconnects <i>Maria Sabrina Sarto, University of Rome, Sapienza Italy</i></p> <p>FR-PM-6-2 <i>A. Naeemi, Georgia Iniversity of Technology</i></p> <p>FR-PM-6-3 <i>K. Banerjee, UCSB</i></p> <p>FR-PM-6-4 EM Modeling of CNT Interconnects <i>Maria Sabrina Sarto, University of Rome, Sapienza Italy</i></p>	<p>1:30 PM TO 5:30 PM</p>
<p>FR-PM-4-5 Cable Shield Tester <i>Lothar (Bud) Hoeft, Consultant, Electromagnetic Effects</i></p> <p>FR-PM-4-6 Loop Resistance Tester <i>William D. Prather, Air Force Research Laboratory, Directed Energy Directorate</i></p> <p>FR-PM-4-7 Single Point Excitation for Hardness Surveillance <i>Lothar (Bud) Hoeft, Consultant, Electromagnetic Effects</i></p>	<p>FR-PM-4-8 CW Illumination and CW-to-Pulse Conversion <i>Parviz Parhami</i></p> <p>FR-PM-4-9 EMP Simulator Testing/PCI <i>Kurt Sebacher, Naval Air Systems Command</i></p> <p>FR-PM-4-10 LRU Interface Testing, TPD Testing and Upset Testing with R2SPG <i>Lothar (Bud) Hoeft, Consultant, Electromagnetic Effects</i></p>	<p>FR-PM-6-5 HF Metrology for Characterization of Nano-materials and Nano-devices <i>Atif Imtiaz, Mitch Wallis and Pavel Kabos, NIST</i></p>	