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THE INTERNATIONAL JOURNAL OF ELECTROMAGNETIC COMPATIBILITY™

2010 EMC Symposium Guide July 25-30 Fort Lauderdale

Your Comprehensive Guide to the Symposium

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Everybody Talks Quality, We Think Seeing Is Believing.

Lots of suppliers claim to make "quality" products. But does quality still mean what it used to mean?
It does at AR.

Over more than 40 years, we've built a reputation for reliable products that go the distance. (And then some). Products that are faster, smaller, and more efficient. Products that outlast, outperform and outrun any in the category. And every one backed by worldwide support and the best no nonsense warranties in the industry.

The way we see it, quality is about results. If a product can't cut it in the real world, you won't get the answers you need. And we won't get the loyal customers we need.

So here's to companies and customers who still respect – and demand – quality.

New ATR26M6G-1
26 MHz - 6 GHz, up to 5000 watts
- High input power capability for stronger radiated fields.
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- Meet most of your testing needs with one antenna.

Newer A Series Amplifiers
10 kHz - 250 MHz, up to 16,000 watts.
- Broader frequency bandwidth - test to all standards.
- 25% to 50% smaller - can fit in your control room.
- Units have superior hybrid cooling system technology which provides greater reliability and lifespan.

Traveling Wave Tube Amplifiers
- Provides higher power than solid state (CW and Pulse).
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- Sleep mode - preserves the longevity, protects the tube.

Newer S Series Amplifiers
0.8 - 4.2 GHz, up to 800 watts
- Smaller and portable.
- Better performance with increased efficiency.
- Linear with lower harmonics and 100% mismatch capability.

Subampability™: (sub-amp-ability). noun:
The ability to use an amplifier individually, or as a building block, upon which power can be added incrementally.

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3 Self - contained models with integrated power meter and signal generator.
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- Incredibly small, never requires batteries.
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- Intelligent amplifier - self diagnostic.
- Reliable

Hybrid Modules
- Power up to 37 dBm from 6 to 18 GHz.
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- Use as a building block anywhere in your design.
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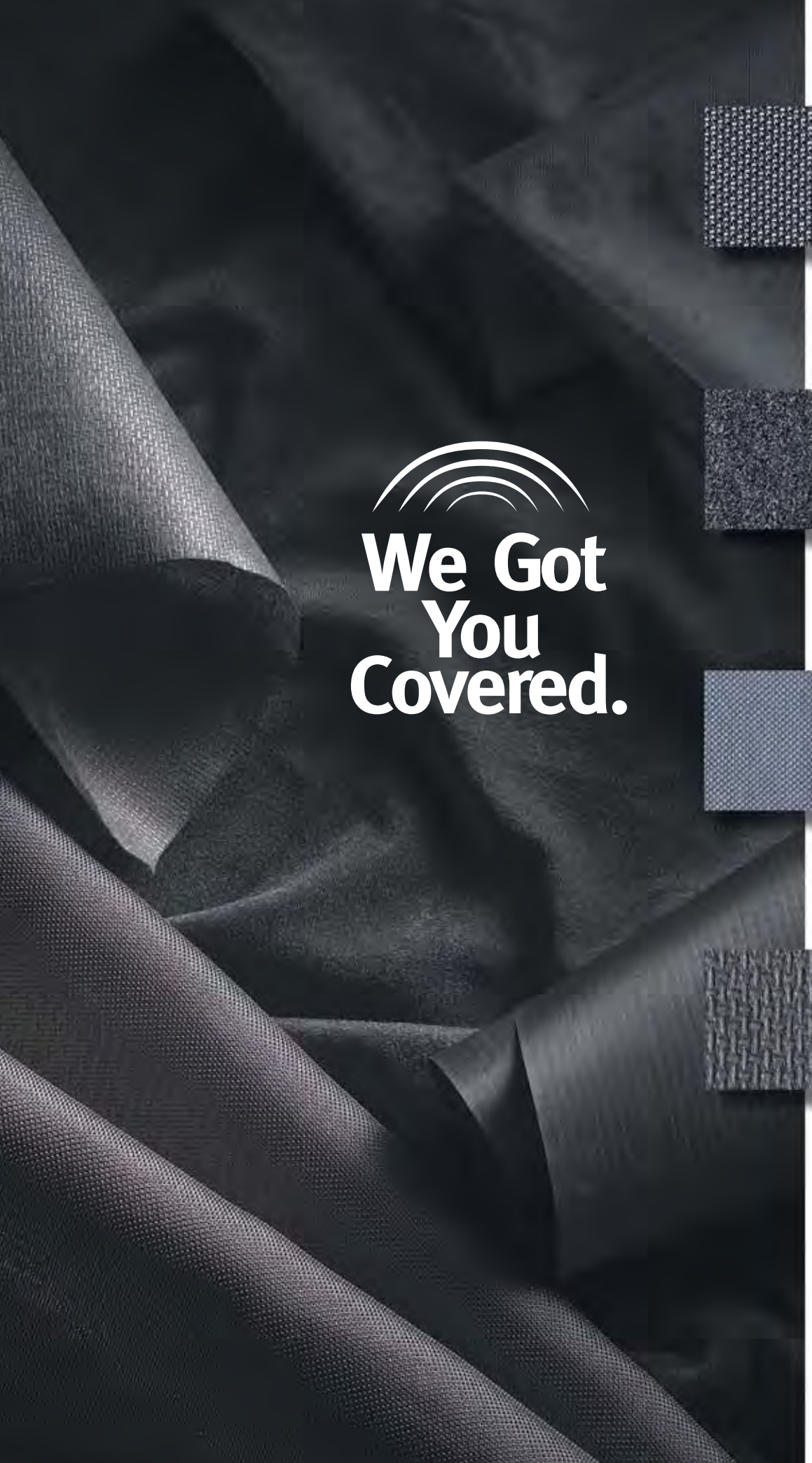

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2010 EMC Symposium Guide

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Dear EMC Society Members, EMC Colleagues, and EMC Community:

You are cordially invited to take part in the IEEE EMC Society's International Symposium on Electromagnetic Compatibility (ISEMC) in Fort Lauderdale, Florida during July 25-30, 2010. The symposium is being held at the Greater Fort Lauderdale/Broward County Convention Center. For attendees navigating with a GPS, its coordinates are 26˚ 05' 55" N, 80˚ 07' 22" W.

Sunny skies and palm-fringed beaches set the scene for adventurous and uniquely Lauderdale experiences that you will enjoy at the ISEMC. Fort Lauderdale is located in the center of South Florida's Gold Coast between Palm Beach and Miami; boasting 23 miles of sun-kissed beaches and weather that cannot be beat!

The treasure of the 2010 symposium is the Technical Program. We have over 2,000 EMC professionals involved in EMC technology participating in a diverse range of sessions, meetings, experiments, demonstrations, professional development and society awards. The Technical Program's theme is "Systems Engineering." We are planning featured displays of highly integrated systems that will emphasize the innovative efforts put forth by EMC engineers to integrate large systems with challenging EMC designs. The technical program reflects the systems engineering theme, highlighting the research, development and fieldwork by our authors and speakers. The workshops and tutorials offer a wealth of information on basic EMC integration. The technical sessions will provide in-depth coverage of system EMC and EMC management, EMI testing, and component design challenges. New for 2010 are the visual presentations of the poster papers in the Exhibit Hall. Meet the authors during the first and last hours of the Exhibit Hall operation.

For our companions, we have a wide choice of tours. The symposium committee is hosting tours Monday through Friday with unique demonstrations picked out by our Floridian resident committee members. In addition, we have worked with the convention center concierge to provide group access to some of the best tourist experiences available to the public. Immediately after the symposium, we have arranged for a post symposium cruise to the western Caribbean. Join us for a week of "Don't Worry, Be Happy," launching from the cruise capital of the U.S. at the Miami pier.

Our 2010 symposium committee is composed of members from across the U.S., a few of them call Florida home. Join us in making Fort Lauderdale all our home for the 2010 ISEMC to share the latest information on EMC and network with EMC Society members and other EMC professionals. You'll return to your home technically enriched, professionally updated, personally refreshed, and ready to solve any EMC challenge.

Fred Heather, General Chairman

2010 IEEE International Symposium on Electromagnetic Compatibility

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www.emc2010.org

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We've Bent The Rules.

AR's Bent-Element Approach Provides A Size Reduction Of Up To 75%, Along With Great Performance.

Our family of Radiant Arrow bent element antennas – for fields from 26 MHz to 6,000 MHz – up to 75% smaller, lighter, and more compact than standard log periodic antennas. Yet they cover broad frequency ranges, offer up to 6dBi gain, and produce high fields even in the toughest applications. The smaller size not only makes them more portable, it minimizes field loss from "room loading."

With these innovative antennas, AR has advanced the science of log periodic antennas. The design is so revolutionary, we had to patent it to protect it.

Our newest Radiant Arrow antenna pushes the boundaries even farther. The ATR26M6G-1 (26 to 6,000 MHz / 5,000 watts input power) goes beyond existing susceptibility requirements, so it's ready for future developments. And the robust design accommodates the high power levels needed to generate significant E-fields.

All the Radiant Arrow antennas are frequency and power-matched to AR amplifiers. And they can be calibrated for emissions testing. No wonder these little antennas are getting such a big reception!

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ARRIVING THIS SUMMER
The New *Interference Technology* Europe EMC Guide

The comprehensive, annual EMC Guide for Europe will:

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Europe EMC Guide

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Symposium Overview

Fort Lauderdale

July 25–30, 2010

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2010 IEEE
Symposium
on EMC

IFI — A Leader in EMC Technology

SYMPOSIUM OVERVIEW

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Welcome to Fort Lauderdale and the 2010 IEEE Symposium on Electromagnetic Compatibility. This Symposium Overview is designed to give you a day-by-day summary of the technical, social, and educational programs available to attendees of the IEEE EMC Symposium and their families. Use it to plan your days and nights and get the maximum benefit of five days plus of non-stop immersion in everything EMC.*

FRIDAY, JULY 23

8:30 a.m. – 5:00 p.m.
ANSI C63.4 Workshop (Room 124)

Noon - 1:00 p.m.

ANSI C63 Lunch (Room 125)

SATURDAY, JULY 24

8:30 a.m. – 5:00 p.m.
ANSI C63.5 Workshop (Room 124)

Noon - 1:00 p.m.
ANSI C63 Lunch (Room 125)

2:00 p.m. – 6:00 p.m.
EMC Society Long Range Planning Meeting (Room 217)

6:30 p.m. – 10:00 p.m.
IEEE EMC Society Board of Directors Executive Committee (ExCom) Meeting (Marriott)

SUNDAY, JULY 25

8:00 a.m. – 4:30 p.m.
Exhibitor Set Up

8:30 a.m. – 5:00 p.m.
IEEE EMC Society Board of Directors Meeting (Room 223/222)

9:00 a.m. - 5:00 p.m.
NVLAP Assessor Training Workshop (Room 207/208)

9:00 a.m. - 6:00 p.m.
IEC 61000-4-21-SC77B - CISPR/A Joint Task Force on Reverberation Chambers (Room 209)

10:00 a.m. – 1:30 p.m.
Bahamas One Day Tour

Noon – 1:00 p.m.
IEEE EMC Society Board of Directors Meeting Lunch (Room 221/220)

11:00 a.m. - 6:00 p.m.
IEC / CISPR TEM Joint Task Force (Room 210)

2:00 p.m. – 5:00 p.m.
Registration Open

5:30 - 7:30 p.m.
WG IEEE 299.1 (Room 114)

7:00 - 10:00 p.m.
ITI TC-5 Meeting (Room 123/122)

MONDAY, JULY 26

7:00 a.m. – 8:30 a.m.
Speaker Breakfast (Palm A)

7:00 a.m. – 5:00 p.m.
Registration Open

7:00 a.m. – 5:00 p.m.
Speaker Ready Room Open (Fort Lauderdale Convention Center)

7:00 a.m. – 9:00 a.m.
Technical Advisory Committee (TAC) Meeting #1 (Room 125)

7:00 a.m. - Noon
SAE AE-4 Electromagnetic Compatibility Committee Meeting (Room 123)

8:00 a.m. – 10:45 a.m.
EMC Society Standards Development Committee (Part 1 of 2) - All attendees welcome (Room 124)

8:00 a.m. – 4:30 p.m.
Exhibitor Set Up

8:30 a.m. – 5:00 p.m.
Billie Swamp Safari Eco-Tour

8:30 a.m. – 5:30 p.m.
iNARTE Examinations Preparation Tutorial (Room 118)

MORNING WORKSHOP & TUTORIALS PROGRAM

8:30 a.m. - noon
MO-AM-1 - Fundamentals of EMC

MO-AM-2 - Practical Radiated Measurements using Antennas and Field Probes - Fundamental and Advanced Topics

MO-AM-3 - Power Quality and Low-Frequency EMC in Electrical Systems Including Smart Grid

MO-AM-4 - ESD and Lightning Testing Additions to MIL-STD-461G

MO-AM-5 - Introduction to EMI Modeling Techniques

10:30 - 11:30 a.m.
SETCom Meeting Standards Education & Training Comittee (Room 124)

11:30 a.m. - 1:30 p.m.
RAC/SACcom Luncheon (Room 315)

11:00 a.m. – 12:30 p.m.
Fort Lauderdale Duck Tour

Noon – 1:00 p.m.
Technical Committee-6: Spectrum Management Meeting (Room 122)

Noon – 1:00 p.m.
IEEE EMC Transaction Associate Editors Lunch (Room 318)

1:00 p.m. – 2:30 p.m.
Fort Lauderdale Duck Tour

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

Solid State Tetrode Tube and Combination Amplifiers

Model Number	Freq Range (MHz)	Min Pwr Out (Watts)	Min Sat Gain (dB)
M/TCCX/SCCX Series • *.01-220 MHz*			
SCCX300	.01-220	300	55
SCCX500	.01-220	500	57
M404	.01-220	500	57
M406	.01-220	1000	60
TCCX2000	.01-220	2000	63
TCCX2200	.01-220	2200	63
TCCX2500	.01-220	2500	64
CMX/SMX Series • *.01-1000 MHz*			
SMX301	.01-1000	300/100	55/50
SMX302	.01-1000	300/200	55/53
SMX303	.01-1000	300/300	55/55
SMX501	.01-1000	500/100	57/50
SMX502	.01-1000	500/200	57/53
SMX503	.01-1000	500/300	57/55
CMX10001	.01-1000	1000/100	60/50
CMX100010	.01-1000	1000/1000	60/60

Microwave Solid State and TWT Amplifiers

Model Number	Freq Range (GHz)	Min Pwr Out (Watts)	Min Sat Gain (dB)
T-200 Series • *200-300 Watts CW 1-21.5 GHz*			
T251-250	1-2.5	250	54
T82-250	2-8	250	54
T188-250	7.5-18	250	54
T2118-250	18.0-21.7	250	54
T-500 Series • *500 Watts CW 1-18 GHz*			
T251-500	1-2.5	500	57
T7525-500	2.5-7.5	500	57
T188-500	7.5-18	500	57
MMT Series • *5-150 Watts, 18-40 GHz*			
T2618-40	18-26.5	40	46
T4026-40	26.5-40	40	46
S/T-50 Series • *40-60 Watts CW 1-18 GHz*			
S21-50	1-2	50	47
T82-50	2-8	50	47
T188-50	8-18	50	47

Solid State Amplifiers

Model Number	Freq Range (MHz)	Min Pwr Out (Watts)	Min Sat Gain (dB)
SMCC Series • *200-1000 MHz*			
SMCC350	200-1000	350	55
SMCC600	200-1000	600	58
SMCC1000	200-1000	1000	60
SMCC2000	200-1000	2000	63
SMC Series • *80-1000 MHz*			
SMC250	80-1000	250	54
SMC500	80-1000	500	57
SMC1000	80-1000	1000	60
SMX-CMX Series • *.01-1000 MHz*			
SMX100	.01-1000	100	50
SMX200	.01-1000	200	53
SMX500	.01-1000	500	57
SVC-SMV Series • *100-1000 MHz*			
SVC500	100-500	500	57
SMV500	500-1000	500	57

Visit IFI.com for additional amplifier models and products.

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1:30 p.m. – 4:00 p.m.
SAE J1752 IC Task Force (Room 123)

1:30 p.m. – 5:50 p.m.
Chapter Officers Training Session (Room 316)

AFTERNOON WORKSHOP & TUTORIALS PROGRAM

1:30 p.m.-5:30 p.m.
MO-PM-1 - Fundamentals of EMC

MO-PM-2 - Practical Radiated Measurements using Antennas and Field Probes - Fundamental and Advanced Topics

MO-PM-3 - All About EMI Above 1 GHz

MO-PM-4 - How to Simplify Real-World Complex Systems into Realistic, Solvable, Accurate Models

MO-PM-5 - Application of Reverberation Chambers

3:00 p.m. – 4:30 p.m.
Fort Lauderdale Duck Tour

3:00 p.m. – 5:00 p.m.
2011 ISEMC Committee Meeting (Room 125)

4:00 p.m. – 6:00 p.m.
US Tag to CISPR/A (Room 124)

4:00 p.m. – 6:00 p.m.
ACIL Conformity Assessment (CAS) Meeting (Room 119)

3:00 p.m. – 5:00 p.m.
2011 ISEMC Committee Meeting (Room 125)

5:30 p.m. – 6:30 p.m.
Reception for Global EMC University students and professors (Room 304)

5:30 p.m. – 7:30 p.m.
Chapter Chair Dinner (Room 316)

6:00 p.m. - 9:00 p.m.
IEC 61000-4-21-SC77B - CISPR/A Joint Task Force on Reverberation Chambers (Room 123)

6:00 p.m. - 9:00 p.m.
Hospitality Night

TUESDAY, JULY 27, 2010

Product Safety Engineering Society-sponsored Colloquium on Product Safety Engineering

7:00 a.m. – 8:30 a.m.
Speaker Breakfast (Palm A)

7:00 a.m. – 8:30 a.m.
STDS WG P1642 (Room 118)

7:00 a.m. – 9:00 a.m.
Technical Committee-1: EMC Management Meeting (Room 125)

7:00 a.m. – 9:00 a.m.
Education & Student Activities Committee (Room 124)

7:30 a.m. – 8:30 a.m.
Technical Committtee-7: Nonsinusoidal Fields Meeting (Room 119)

8:00 a.m. – 5:00 p.m.
Exhibit Hall Open

8:00 a.m. – 9:00 a.m.
Technical Committtee-2: EMC Management Meeting (Room 122)

8:30 a.m. – 5:30 p.m.
Global University (Room 304)

8:30 a.m. – noon
Junior Technical Program

9:00 a.m. – 4:30 p.m.
Butterflies and Fleas

MORNING TECHNICAL PROGRAM

10:30 a.m. – noon
TU-AM-1 - Antennas 1

TU-AM-2 - Power Supply Noise Control

10:30 a.m. - noon

TU-AM-3 - SPECIAL SESSION: EVOLVING TRENDS IN SPECTRUM MANAGEMENT AND ENGINEERING

10:30 a.m. – noon

TU-AM-4 - Special Session: EM Information Leakage

TU-AM-5 - Cavities and Statistics

11:00 a.m. – 4:30 p.m.

Island Getaway & Beach Adventure

Noon – 1:00 p.m.

Technical Committee-9: Computational Electromagnetic Meeting (Room 124)

Noon – 1:30 p.m.

Technical Committee-3: Electromagnetic Environment Meeting (Room 119)

Noon – 1:30 p.m.

G46 EMC Subcommittee Meeting (Room 125)

AFTERNOON TECHNICAL PROGRAM

1:30 – 5 p.m.

TU-PM-1 - Measurements 1

TU-PM-2 - Nanotechnology & Advanced Materials

TU-PM-3 - PCB Concerns

1:30 p.m. - 5 p.m.

TU-PM-4 - SPECIAL SESSION: EM INFORMATION LEAKAGE

1:30 – 5 p.m.

TU-PM-5 - High Power and Time Domain Simulation

2:00 p.m. – 4:00 p.m.

P1309 Committee Meeting (Room 122)

5:30 p.m. – 9:00 p.m.

Welcome Reception

WEDNESDAY, JULY 28, 2010

Product Safety Engineering Society-sponsored Colloquium on Product Safety Engineering

7:00 a.m. – 8:30 a.m.

Speaker Breakfast (Palm A)

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

7:00 a.m. – 8:00 a.m.

Intertek's Broad Spectrum EMC Forum

7:00 a.m. – 8:30 a.m.

EMC Society Standards Development Committee (Part 2 of 2) - All attendees welcome (Room 122)

7:00 a.m. – 8:30 a.m.

Product Safety Engineering Society (Room 119)

7:00 a.m. – 9:30 a.m.

Tile! Users Group (Room 124)

8:00 a.m. – 5:00 p.m.

Exhibit Hall Open

8:00 a.m. – noon

PAR-1688 Working Group Meeting (Room 315)

8:30 a.m. – noon

Junior Technical Program (Room 301)

8:30 a.m. – 5:30 p.m.

Global University (Room 304)

MORNING TECHNICAL PROGRAM

8:30 a.m. – noon

WED-AM-1 - Antenna 2

WED-AM-2 - HPEM

8:30 p.m. - noon

WED-AM-3 - SPECIAL SESSION: HYBRID TECHNIQUES FOR EMC ANALYSIS

WED-AM-4 - Radiation Coupling and EMI

WED-AM-5 - Signal Integrity I

9:30 a.m. – 4:30 p.m.

Shop Till You Drop

10:00 a.m. – 4:00 p.m.

South Beach, Miami

10:30 a.m. – 3:30 p.m.

Las Olas Boulevard Progressive Lunch and Shopping

11:30 a.m. – 1:30 p.m.

Founders Luncheon (Room 316)

Noon – 1:30 p.m.

Amateur Radio Lunch (Room 122)

Noon – 1:30 p.m.
Technical Committee-5: High Power Electromagnetics Meeting (Room 125)

Noon – 2:30 p.m.
Technical Committee-4: Electromagnetic Interference Control Meeting (Room 124)

Noon – 1:00 p.m.
Technical Committee-10: Signal Integrity Meeting (Room 123)

Noon – 1:00 p.m.
Technical Committee-11: Nanotechnology Meeting (Room 118)

AFTERNOON TECHNICAL PROGRAM

1:30 – 5:30 p.m.
WED-PM-1 - Measurement 2

WED-PM-2 - Reverberation 1

1:30 p.m. - 5:30 p.m.
WED-AM-4 - SPECIAL SESSION: MULTI-GBPS INTERCONNECT SIMULATION AND MEASUREMENT

1:30 – 5:30 p.m.
WED-PM-4 - Filtering, Automotive, & Cable Concerns

WED-PM-5 - PCB Simulation

6:30 p.m. – 9:30 p.m.
Gala Evening Event

THURSDAY, JULY 29

Product Safety Engineering Society-sponsored Colloquium on Product Safety Engineering

7:00 a.m. – 8:30 a.m.
Speaker Breakfast (Palm A)

7:00 a.m. – 9:00 a.m.
Technical Advisory Committee (TAC) Meeting #2 (Room 124)

7:00 a.m. – 5:30 p.m.
Global University (Room 304)

8:00 a.m. – 1:00 p.m.
Exhibit Hall Open

8:30 a.m. - noon
Junior Technical Program (Room 301)

MORNING TECHNICAL PROGRAM

8:30 a.m. - noon
TH-AM-1 - Measurements 2 & Reverberation 3

TH-AM-2 - Capturing the Electromagnetic Environment 1

8:30 a.m. - noon
TH-AM-3 - SPECIAL SESSION: MODELING/SIMULATION VALIDATION

8:30 a.m. - noon
TH-AM-4 - Transmission Line Noise Concerns

TH-AM-5 - Signal Integrity II

9:30 a.m. – 3:30 p.m.
Japanese Gardens and Museums

11:00 a.m.
Riverfront Cruise

AFTERNOON TECHNICAL PROGRAM

1:00 p.m. – 2:30 p.m.
Awards Luncheon

3:00 – 5 p.m.
TH-PM-1 - Special Topics

TH-PM-2 - Systems Simulation

3:00 - 6:00 p.m.
TH-PM-3 - SPECIAL SESSION: NANOMATERIALS AND NANODEVICES FOR EMC APPLICATIONS

3:00 – 5:00 p.m.
TH-PM-4 - Capturing the Electromagnetic Environment 2

5:30 p.m. – 8:00 p.m.
Intertek's Broad Spectrum EMC Forum

5:30 p.m. – 7:30 p.m.
WG IEEE 299.1 (Part 2 of 2) (Room 122)

6:00 p.m. – 10:00 p.m.
IEEE EMC Society Board of Directors Meeting (Room 316)

6:00 p.m.
Jungle Queen Dinner Cruise

6:00 p.m. - 9:00 p.m.
Hospitality Night

FRIDAY, JULY 30

7:00 a.m. – 8:30 a.m.
Speaker Breakfast (Palm A)

8:00 a.m. – 5:00 p.m.
iNARTE Certification Examinations (Room 125)

MORNING WORKSHOP & TUTORIALS PROGRAM

8:30 a.m.-noon
FR-AM-1 - EMC Leadership

FR-AM-2 - Application of Time Domain Measurements for Test Site Validation and Antenna Calibration

FR-AM-3 - EMC Society History

FR-AM-4 - Fundamentals of Signal Integrity

FR-AM-5 - Emissions and Immunity Near Field Scanning Techniques

9:30 a.m. – 3:00 p.m.
Vizcaya Museum and Gardens

AFTERNOON WORKSHOP & TUTORIALS PROGRAM

1:30-5:30 p.m.
FR-PM-1 - EMC Leadership

FR-PM-2 - Basic EMC Measurements

FR-PM-3 - Capturing the Electromagnetic Environment

FR-PM-4 - Electromagnetic Field Coupling with Transmission Lines, from Classical Theory to Recent Enhancements

FR-PM-5 - Practical Tips on 17025 Compliance

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

2011 IEEE International Symposium on Electromagnetic Compatibility

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Call for Papers

EMC 2011 is a Technical Symposium. Technical Papers are the essence of our Technical Program. Original, unpublished papers on all aspects of electromagnetic compatibility are invited.

*Late papers will NOT be accepted.

Important Dates

- *Preliminary Full Paper Manuscript:* November 1, 2010 - January 15, 2011
- *Acceptance Notification:* March 15, 2011
- *Final Paper and Workshop/Tutorial Material Due:* May 1, 2011

Booth 230

EMC SOCIETY

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EMC 2010 JULY 25 - 30

SUNDAY

7 AM	8 AM	9 AM	10 AM	11 AM	Noon	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM
							Registration Open					
	Exhibitor Set Up											
		EMC Society Board of Directors Meeting										

MONDAY

7 AM	8 AM	9 AM	10 AM	11 AM	Noon	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM
Speaker Breakfast			Break		Lunch			Break			Exhibitor Hospitality Night (until 9 PM)	
Registration Open												
	Workshops and Tutorials					Workshops and Tutorials						
	Exhibitor Set Up											
						Poster Paper Session 1: Display Board Preparation						
										Chapter Chair Dinner		
										Global EMC Reception		

TUESDAY

7 AM	8 AM	9 AM	10 AM	11 AM	Noon	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM
Speaker Breakfast			Break		Lunch			Break			Welcome Reception (until 9 PM)	
Registration Open												
			Technical Paper Sessions			Technical Paper Sessions						
			Special Sessions			Special Sessions						
	Poster Paper Session 1: Set Up Display, 8 AM; Meet the Author at 8:30 AM; Display 9:30 AM - 5:30 PM											
		Exhibit Hall Open										
			Demonstrations			Demonstrations						
		Junior Technical Program										
		Global EMC University				Global EMC University						

WEDNESDAY

7 AM	8 AM	9 AM	10 AM	11 AM	Noon	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM
Speaker Breakfast			Break		Lunch			Break				Gala Evening Event (until 9:30 PM)
Registration Open												
				Founders Luncheon								
		Technical Paper Sessions				Technical Paper Sessions						
		Special Sessions				Special Sessions						
		Poster Paper Session 1 Display				Poster Paper Session 2 Display						
	Poster Paper Session 2: Display Board Preparation, 8 AM - Noon; Set Up Display, Noon - 1:30 PM											
		Exhibit Hall Open										
		Demonstrations				Demonstrations						
		Junior Technical Program										
		Global EMC University				Global EMC University						

THURSDAY

7 AM	8 AM	9 AM	10 AM	11 AM	Noon	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM
Speaker Breakfast			Break			Awards Luncheon					Exhibitor Hospitality Night (until 9 PM)	
Registration Open												
	Technical Paper Sessions							Technical Paper Sessions				
	Special Sessions							Special Sessions				
	Poster Paper Session 2 Display, 8:30 AM; Meet the Author at Noon											
	Exhibit Hall Open											
	Demonstrations											
	Junior Technical Program											
	Global EMC University							Global EMC University				

FRIDAY

7 AM	8 AM	9 AM	10 AM	11 AM	Noon	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM
Speaker Breakfast			Break		Lunch			Break				
Registration Open												
	Workshops and Tutorials					Workshops and Tutorials						

EMC 2010 JULY 25 - 30

Workshops & Tutorials

Workshops and tutorials, to be presented Monday and Friday, provide an opportunity to learn the basics in EMC from the experts in industry and academia. Tutorials are set up in a classroom format with the lecturer providing instruction on their area of expertise.

Workshops provide an interactive format to share the subject topic with the workshop facilitator. The EMC areas to be covered include the popular series on introduction to EMC to contemporary industry topics facilitated by the EMC Society Technical Committees, Standards Working Group and others.

Technical Papers

Technical Papers will be provided on Tuesday and Wednesday during multiple concurrent sessions. The papers represent the latest in technology as presented by industry, government and academia. All papers have been peer reviewed and accepted by the EMC Society's Technical Committees. The Technical Papers will be given in two formats: oral presentation sessions and illustrated poster paper sessions.

Presentation of Technical Papers Sessions

The Presentation of Papers Session is an oral briefing with charts on a digital projector of the speaker's technical paper in a theatre-style room setup. The Session Chair will moderate the meeting between speaker presentations, and questions and answers with the attendees and speakers. The presentation of Technical Papers Sessions are aligned according to technical topic areas associated with the IEEE EMC Society Technical Committees.

Poster Paper Sessions

The Poster Paper Sessions are the featured opening and closing technical sessions of the symposium. The Poster Paper Sessions will be held in special aisles in the Exhibit Hall and presented with a totally new format in 2010.

The new format abandons the past practice of attaching papers to a bulletin board and instead offers a more visual presentation. The new format uses a "display board," which is a 4-foot by 3-foot tri-folded piece of cardboard. The authors will be given the opportunity before their respective session to prepare their visual display in the speaker ready room. The speaker ready room will have the display boards, color printer, and other graphic supplies (e.g. colored paper, string, ribbons, clip-art, etc.) for the authors to transform their paper to a display that illustrates their papers. The technical attendees at the symposium will be given ballots to vote on best poster paper visual presentations, which includes the categories of Best Use of Color, Best Use of 3 Dimensions, Best Use of 2 Dimensions, and more. The Best Visual Presentations Awards will be made at the Awards Luncheon.

Special Sessions

Special Sessions (Invited Papers) will be presented on Tuesday, Wednesday and Thursday. These Special Sessions may tend to be more of a tutorial nature covering all the basics or updates of that area.

Global EMC University

Global EMC University is 20 hours of instruction on basic EMC-related topics that is run in parallel with the traditional technical sessions at the symposium. Students are encouraged to participate in symposium workshops, exhibits and social activities when they are not in class. Classes are taught by an international panel of educators, who are selected for this program based on their reputation for excellence in areas of practical importance to EMC engineers and their demonstrated ability to communicate effectively with students who are new to the field.

Junior Technical Program

8:30 a.m.-noon
Tuesday through Thursday

The Junior Technical Program, formerly the "Youth Program," will consist of two workshops where youth companions of symposium participants will learn about EMC by practical projects and activities that demonstrate some basic EMC principles.

There will also be a guided tour of the exhibition floor where the experts will show us their newest and coolest EMC gadgets on Thursday morning. This tour is open to adults, as well as the youth companions.

The 2010 Junior Technical Program will feature electromagnetic (EM) fields. What are these fields that make remote controls, cell phones and so much of our technology work, and unfortunately also cause electromagnetic interference (EMI)?

During the two workshops, the participants will measure EM fields using different types of meters, probes and antennas. They will also build some of their own measurement equipment. They will see how different electrical and electronic devices are surrounded by fields that they can measure and view on scopes and analyzers.

Finally, they will tour the Exhibition Hall and see state-of-the-art equipment for emitting, receiving and measuring EM fields. All interested participants are encouraged to register for the Junior Technical Program so an adequate number of project kits can be prepared. The Youth Program is recommended for ages 8 to 17; younger children are welcome if accompanied by adults or older siblings.

Also, to avoid confusion, it should be noted that Junior Technical Program registration does not include access to the Companion Suite or social events.

International Certification Services, Inc. (ICSI), Minnesota, is once again this year Patron of the Junior Technical Program. ICSI has been the patron for at least the past seven years, which has enabled the program to be offered free of charge.

MORNING SESSIONS 8:30 AM-NOON

MONDAY INCLUDES:*

Workshops/Tutorials

- Fundamentals of EMC
- Practical Radiated Measurements Using Antennas and Field Probes – Fundamental and Advanced Topics
- Power Quality and Low-Frequency EMC in Electrical Systems Including Smart Grid
- ESD and Lightning Testing Additions to MIL-STD-461G
- Introduction to EMI Modeling Techniques
- All About EMI Above 1 GHz
- How to Simplify Real-World Complex Systems into Realistic, Solvable and Accurate Models
- Application of Reverberation Chambers
- iNARTE Workshop (Page 56)

Poster Paper Session 1

- Display Board Preparation

Exhibitor Set Up

Meetings

- Technical Advisory Committee (Page 52)
- TC-6: Spectrum Management (Page 52)

Other Events

- Global University Reception (Page 54)
- Exhibitor Hospitality Night (Page 58)

Tours

- Billie Swamp Safari Eco-Tour (Page 60)
- Fort Lauderdale Duck Tour (Page 64)

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

Fundamentals of EMC

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

Chair: Daryl Beetner, Missouri University of Science and Technology, Missouri, U.S.A.

Abstract

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.

Planned Speakers and Topics

1. **Introduction** [8:30-8:35]
   Daryl Beetner, Missouri University of Science and Technology, Missouri, U.S.A.
2. **Inductance and Partial Inductance, What's it all mean?** [8:35-9:30]
   Bruce Archambeault, IBM, U.S.A.
3. **PCB Design** [9:30-11:00, with break from 10-10:30]
   Daryl Beetner, Missouri University of Science and Technology, Missouri, U.S.A.
4. **Shielding** [11:00-Noon]
   Frank Leferink, University of Twente, Netherlands
5. **Why and How to Ground Electrical Systems** [1:30-3]
   Tom Van Doren, Missouri University of Science and Technology, U.S.A.
6. **Transmission Lines and Crosstalk** [3:30-4:30]
   Flavio Canavero, Politecnico di Torino, Italy
7. **The Fundamentals of EM Measurements and Modeling** [4:30-5:30]
   Colin. Brench, Southwest Research Institute, U.S.A.

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Practical Radiated Measurements Using Antennas and Field Probes - Fundamental and Advanced Topics

MO-AM-2 | Full-day Tutorial | Room 221/220

Chair: Zhong Chen, ETS-Lindgren, Cedar Park, Texas, U.S.A.

Abstract

This tutorial is designed to be a full-day two-part tutorial. The morning session covers the basic theory and applications of EMC radiated measurements using antennas and field probes, and the afternoon session will cover more advanced topics. The morning session will introduce the basic theory and terminologies. Applications according to US and international standards will also be covered. The afternoon session covers more advanced topics. The morning session introduces the basic theory and terminologies. Applications according to U.S. and international standards are also covered. The afternoon session covers applications of antennas and field probes beyond those specified in typical manufacturer's data sheets. The discussions are concentrated on some specific aspects of antennas and probes in cali

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Booth 520

MORNING SESSIONS 8:30 AM-NOON

Practical Radiated Measurements Using Antennas and Field Probes - Fundamental and Advanced Topics

Continued from Page 16

bration and testing to EMC industry standards, such as background information and rationales for recent changes in the standards, and impacts of these changes on daily EMC measurements.

Other topics include time domain methods related to antenna calibration and usage, system integration and instrumentation considerations in antennas and probes applications. The implications of the antenna characteristics on EMC testing are discussed, including the nature and use of antenna factors, gain, radiation resistance, VSWR, etc. Uncertainty evaluations of the antenna and probe calibrations are considered, along with the implications of the uncertainties in typical end use situations. Applications of the antennas and probes in radiated emissions and immunity tests, as well as radiated site validation measurements are addressed, including those for measurements below and above 1 GHz. 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.

Planned Speakers

1. **Test Equipment Fundamentals**
   Werner Schaefer, Cisco Systems, California, U.S.A.
2. **Field Probe Basics**
   Zhong Chen, ETS-Lindgren, Texas, U.S.A.
3. **Introduction to Antennas**
   Vince Rodriguez, ETS-Lindgren, Texas, U.S.A.
4. **Basic Time Domain Analysis of Antennas Used for EMC**
   Robert Johnk, NIST, and Dennis Camell, Institute for Telecommunication Sciences, Colorado, U.S.A.
5. **Test Equipment Specifics**
   Werner Schaefer, Cisco Systems
6. **Advance Topics for EMC Measurements Using Field Probes**
   Zhong Chen, ETS-Lindgren
7. **Time Domain Analysis and Usage of Antennas for EMC II**
   Robert Johnk, NIST, and Dennis Camell, ITS
8. **Update on Antenna / Probe Standards and Applications**
   Mike Windler, Underwriters Laboratory, Illinois, U.S.A.
9. **Antenna Calibration and Measurement Uncertainty**
   Bob DeLisi, Underwriters Laboratory, New York, U.S.A.

Power Quality and Low-Frequency EMC in Electrical Systems Including Smart Grid

MO-AM-3 | Half-day Workshop | Room 209/210

Chair: Dr. Magnus Olofsson, Swedish National Electrical Safety Board, Kristinehamn, Sweden
Co-Chair: Dr. William A. Radasky, Metatech Corporation, California, U.S.A.

Abstract
The aim of the workshop is to elucidate the area of low-frequency EMC including its relation to Power Quality (PQ) in electric power systems. For efficient control and use of electric energy, electronics and power electronics are increasingly used within electrical systems. Examples of such technologies are solar and wind power, electric vehicles, variable speed drives and energy efficient luminaries. These technologies are also used in evolving Smart Grid applications. A basic performance of such modern electrical systems is EMC in the area of low frequency conducted disturbances. The workshop will focus on applications and standards for low-frequency EMC and how it is related to Power Quality in the view of future electric power systems including Smart Grid.

Planned Speakers and Topics

1. **Power Quality (PQ) and Low-Frequency EMC (LF EMC) – Definitions, Differences and Similarities**
   Dr. Magnus Olofsson, Swedish National Electrical Safety Board, Sweden
2. **Industrial Applications – PQ and LF EMC**
   Dr. Kai Sang Lock, PQR Consultants, Singapore
3. **How IEC Standards Deal with LF EMC and PQ**
   Dr. William A. Radasky, Metatech Corporation, California, U.S.A.
4. **Smart Grid and Renewables – Power Quality and LF EMC Issues and Opportunities**
   Dr. Alex McEachern, Power Standards Lab, California, U.S.A.

ESD and Lightning Testing Additions to MIL-STD-461G

MO-AM-4 | Half-day Workshop | Room 203/204

Chair: Fred Heather, NAVAIR, Maryland, U.S.A.

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MORNING SESSIONS 8:30 AM-NOON

ESD and Lightning Testing Additions to MIL-STD-461G

Continued from Page 18

Co-Chair: Manuel Rodriguez, U.S. Air Force ASC Wright-Patterson AFB, Ohio

Abstract

The future version MIL-STD-461G is considering adding ESD and Lightning requirement to the EMI Interface Standard. The purpose of this workshop is to gather industry insight and experience with these requirements for consideration. The agenda includes looking at a draft starting point and various speakers who will share their insights and expertise. The session will end with an open discussion between the panel of speakers and the attendees.

Planned Speakers and Topics

1. **Nearby Lightning Electromagnetic Field Environment**
   Farhad Rachide, Swiss Federal Institute of Technology Electromagnetic Compatibility Laboratory, Lausanne, Switzerland & Marcos Rubinstein, University of Applied Sciences of Western Switzerland, Yverdon, Switzerland
2. **ESD Test Methods**
   Finbarr O'Connor, Alion Science and Technology, Philadelphia, Pennsylvania, U.S.A.
3. **Experience of Testing to DO-160**
   Josh Bakk, Rockwell-Collins, Cedar Rapids, Iowa, U.S.A.

Introduction to EMI Modeling Techniques

MO-AM-5 | Half-day Tutorial | Room 207/208

Chair: Chuck Bunting, Oklahoma State University, Oklahoma, U.S.A.

Abstract

This tutorial 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 weaknesses, so engineers can decide which techniques are appropriate for their types of problems. The format will be a conference presentation style (lecture) followed by questions moderated by the chairman. The chairman takes responsibility for weaving the threads of cohesiveness and dissimilarities between the methods.

Planned Speakers and Topics

1. **Overview of Electromagnetic Modeling Software**
   Todd Hubing, Clemson University, Clemson, South Carolina, U.S.A.
2. **The Transmission Line Matrix (TLM) Method**
   David Johns, CST of America Inc., Boston, Massachusetts, U.S.A.
3. **Introduction to the Partial Element Equivalent Circuit Technique**
   Giulio Antonini, University of L'Aquila, L'Aquila, Italy
4. **The Finite-Difference Time-Domain Technique**
   Sam Connor, IBM, Raleigh, North Carolina, U.S.A.
5. **Understanding the Finite Element Method**
   Chuck Bunting, Oklahoma State University, Stillwater, Oklahoma, U.S.A.
6. **Introduction to the Method of Moments**
   Ji Chen, University of Houston, Houston, Texas, U.S.A.

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Booth 930

AFTERNOON SESSIONS 1:30 PM-5:30 PM

Fundamentals of EMC
MO-PM-1 | Full-day Tutorial | Room 223/222

Chair: Daryl Beetner, Missouri University of Science and Technology, Missouri, U.S.A.

Abstract
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.

See Page 16 for planned speakers and topics.

Practical Radiated Measurements Using Antennas and Field Probes - Fundamental and Advanced Topics
MO-PM-2 | Full-day Tutorial | Room 221/220

Chair: Zhong Chen, ETS-Lindgren, Cedar Park, Texas U.S.A.

Abstract
This tutorial is designed to be a full-day two-part tutorial. The morning session covers the basic theory and applications of EMC radiated measurements using antennas and field probes, and the afternoon session will cover more advanced topics. The morning session will introduce the basic theory and terminologies. Applications according to US and international standards will also be covered. The afternoon session covers more advanced topics. The morning session introduces the basic theory and terminologies. Applications according to U.S. and international standards are also covered. The afternoon session covers applications of antennas and field probes beyond those specified in typical manufacturer's data sheets. The discussions are concentrated on some specific aspects of antennas and probes in calibration and testing to EMC industry standards, such as background information and rationales for recent changes in the standards, and impacts of these changes on daily EMC measurements.

Other topics include time domain methods related to antenna calibration and usage, system integration and instrumentation considerations in antennas and probes applications. The implications of the antenna characteristics on EMC testing are discussed, including the nature and use of antenna factors, gain, radiation resistance, VSWR, etc. Uncertainty evaluations of the antenna and probe calibrations are considered, along with the implications of the uncertainties in typical end use situations. Applications of the antennas and probes in radiated emissions and immunity tests, as well as radiated site validation measurements are addressed, including those for measurements below and above 1 GHz. 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.

See Page 16 for planned speakers and topics.

All About EMI Above 1 GHz
MO-PM-3 | Half-day Tutorial | Room 203/204

Chair: Hiroshi Yamane, NTT Facilities, Inc./VCCI Council, Tokyo, Japan
Co-chair: H.R. Hofmann, Electromagnetic Compatibility Engineering, Naperville, Illinois, U.S.A.

Abstract
This tutorial will cover new national regulations, test site validation with SVSWR on radiated emission requirements above 1 GHz as well as design issues and solutions. Main objective is to share up-to-date information of key national regulations; how "over-1GHz" to be controlled, and to discuss test site validation with SVSWR with comprehensive test results as well as product design challenge and proposal. The national requirements are new and engineering discussion on practical test results for test site evaluation would give great help to the audience.

Planned Speakers and Topics

1. **FCC Emissions Tests Above 1 GHz for Digital Devices**
   Ghery S. Pettit, Intel Corporation, U.S.A.
2. **EMI Requirements Above 1 GHz in BSMI, Taiwan**
   Yung Chi Tang, BSMI, Taiwan
3. **EMI Measurements Above 1 GHz**
   Hiroshi Yamane, NTT Facilities Inc. (VCCI Tech SC Chair), Japan
4. **Setup Table for EMI Testing Above 1 GHz**
   Martin Wright, British Telecommunications, England
5. **Antennas for EMI Testing Above 1 GHz**
   Chiharu Miyazaki, Mitsubishi Electric (VCCI Tech SC), Japan

How to Simplify Real-World Complex Systems into Realistic, Solvable, Accurate Models
MO-PM-4 | Half-day Tutorial | Room 207/208

Co-Chair: Bruce Archambeault, IBM, North Carolina, U.S.A., & David Johns, CST, Massachusetts, U.S.A.

Abstract
This tutorial will introduce the audience to the techniques

AFTERNOON SESSIONS 1:30 PM-5:30 PM

used to simplify real world complex systems into models for full wave simulation that are able to be solved with today's software tools, while maintaining the required accuracy to solve the problem of interest. Validation of these simplified models will also be discussed. This is similar to a tutorial in 2009 that was heavily attended. Many attendees indicated they would like to see the tutorial continued. There will be new material in the 2010 tutorial.

Planned Speakers and Topics

1. **Simplification Process of a Complex System into a Useful Numerical Model**
   Frederico Centola, Apple Computer
2. **Model Partitioning for Solving Complex EMC Problems**
   Colin E. Brench, Southwest Research Institute, Texas, U.S.A.
3. **Partitioning, Transient Co-Simulation and Equivalent Sources in EMC/EMI Modeling**
   David P. Johns, PhD, CST of America
4. **Modeling and Simulation of High Voltage Cable Transfer Impedance for Automotive Electric Propulsion System RFI Reduction**
   Yeong Yoon and Hyok J. Song, HRL Laboratories, LLC, Malibu, California, U.S.A.
5. **Synthesis of Comprehensive Vehicle System EMI/EMC Model from Subsystem Models**
   Carl Baldwin, Lockheed Martin, U.S.A.
6. **Converting Complex Systems into a Series of Smaller Models and Combining Results**
   Bruce Archambeault, PhD, IBM Corporation, North Carolina, U.S.A.

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Application of Reverberation Chambers

MO-PM-5 | Half-day Tutorial | Room 209/210

Chair: Chuck Bunting, Oklahoma State University, Oklahoma, U.S.A.

Abstract

This tutorial will provide an introduction to recent applications of reverberation chambers. It is intended to provide EMC engineers who are interested in applying reverberation chambers to various measurement issues and the extension of reverberation chambers to solve a variety of EMC problems. The half-day tutorial provides a brief overview of RC theory, followed by recent applications of RCs. The format will be a conference presentation style (lecture) followed by questions moderated by the chairman.

Planned Speakers and Topics

1. **Introduction – Rationale for RC testing**
   Vignesh Rajamani, Oklahoma State University, Oklahoma, U.S.A.
2. **Overview of RC Theory**
   Chuck Bunting, Oklahoma State University, Oklahoma, U.S.A.
3. **Models for Antennas in Reverberation Chambers**
   John Ladbury, National Institute of Science and Technology (NIST), Colorado, U.S.A.
4. **Characterization of EM Environments Using RC Techniques**
   Chuck Bunting and Vignesh Rajamani, Oklahoma State University, Oklahoma, U.S.A.
5. **Wireless Channel Modeling**
   John Ladbury, National Institute of Science and Technology (NIST), Colorado, U.S.A.
6. **Below-Decks EME: RF Propagation in Coupled Complex Cavities**
   Greg Tait, Naval Surface Warfare Center, Dahlgren, Virginia, U.S.A.

MORNING SESSIONS 10:30 AM-NOON

TUESDAY INCLUDES:*

Technical Paper Sessions

- Antennas 1
- Power Supply Noise Control
- Cavities and Statistics
- Measurements 1
- Nanotechnology & Advanced Materials
- PCB Concerns
- High Power and Time Domain Simulation

Special Sessions

- Evolving Trends in Spectrum Management and Engineering
- EM Information Leakage

Poster Paper Session 1

- Set up, meet the author, display

Global EMC University (Page 54)

Exhibit Hall & Demonstrations

Meetings

- ESAC (Page 52)
- TC-1 EMC Management (Page 52)
- TC-2 EMC Measurements (Page 52)
- TC-7 Nonsinusoidal Fields (Page 52)
- TC-9 Computational Electro-magnetic (Page 52)

Other Events

- Jr. Technical Program (Page 15)
- PSES Colloquium (Page 55)
- Welcome Reception (Page 58)
- Chapter Chair Dinner (Page 58)

Tours

- Butterflies and Fleas (Page 60)
- Island Getaway and Beach Adventure (Page 64)

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

Antennas 1
TU-AM-1 | Room 223/222

Chair: Cliff Hauser, Raytheon Missile Systems

10:30-11 a.m.
Influence of Antenna Pattern on Site Validation above 1 GHz for Site VSWR Measurements
F. Trautnitz, J. Riedelsheimer, Albatross Projects GmbH, Nattheim, Germany

11-11:30 a.m.
A Reference Antenna Method for Non-resonant Electrically Short Monopole Antennas
M. Ishii, Y. Shimada, National Institute of Advanced Industrial Science and Technology, National Metrology Institute of Japan, Tsukuba, Japan

11:30-noon
Aperture Coupling Near-Field Cavity Effects for Electromagnetic Testing with Measurements on a Slotted Circular Cylinder
M. L. Waller, Redstone Test Center (P), Redstone Arsenal, U.S.A.; T. H. Shumpert, Redstone Test Center (P), Redstone Arsenal, U.S.A.; R. W. Scharstein, University of Alabama, Tuscaloosa, U.S.A.

Sponsored by TC2

Power Supply Noise Control
TU-AM-2 | Room 221/220

Chairs: Noel Sargent, NASA & John Kraemer, Rockwell-Collins

10:30-11 a.m.
Impact of PCB Design on Switching noise and EMI of Synchronous DC-DC buck Converter
K. Koo, J. Kim, M. Kim, J. Kim, KAIST, Daejeon, Republic of Korea

11-11:30 a.m.
Switching Voltage Regulator Noise Coupling to Signal Lines in a Server System
G. Ouyang, Intel Corp., Dupont, U.S.A.; X. Ye, Intel Corp., Hillsboro, U.S.A.; T. Nguyen, Intel Corp., Dupont, U.S.A.

11:30-noon
Investigation of Noise Coupling from Switching Power Supply to Signal Nets
S. Wu, Missouri University of Science and Technology, Rolla, U.S.A.; K. Kam, Missouri University of Science and Technology, Rolla, U.S.A.; D. Pommerenke, Missouri University of Science and Technology, Rolla, U.S.A.; B. Cornelius, Apple Inc., Cupertino, U.S.A.; H. Shi, Apple Inc., Cupertino, U.S.A.; M. Herndon, Apple Inc., Cupertino, U.S.A.; J. Fan, Missouri University of Science and Technology, Rolla, U.S.A.

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MORNING SESSIONS 10:30 AM-NOON

SPECIAL SESSION: Evolving Trends in Spectrum Management and Engineering
TU-AM-3 | Room 209/210

Chair: Larry Cohen, Naval Research Labs

Abstract
This Special Session will present methodologies and measurement techniques to both control and quantify the use of the spectrum. Special attention will be paid to shortfalls in current spectrum management approaches and ways to mitigate those problems. The objective of this session is twofold. The first objective is to present some of the latest research into the design of components, such as power amplifiers, filters and waveforms, which promote more optimal use and co-habitation of the electromagnetic spectrum by wireless and radar systems. The second objective is to inform the attendee on measurement strategies and techniques that more accurately and effectively measure spectrum occupancy by wireless devices in a congested electromagnetic spectral environment.

10:30-11 a.m.
High-Resolution Propagation Measurements Using Biconical Antennas and Signal Processing
R. T. Johnk, J. D. Ewan, N. DeMinco, R. L. Carey, P. M. McKenna, C. J. Behm, T. J. Riley, S. Carroll, M. A. McFarland, J. W. Leslie, Institute for Telecommunication Sciences, Boulder, U.S.A.

11-11:30 a.m.
Filter Technology for Spectrum Management
D. R. Jachowski, A. C. Guyette, Naval Research Laboratory, Washington, U.S.A.

Sponsored by TC6

SPECIAL SESSION: EM Information Leakage
TU-AM-4 | Room 207/208

Chairs: Dr. Tetsuya Tominaga, NTT Corporation and Dr. William Radasky, Metatech Corporation

Abstract
This special session presents an overview of the research trends related to information leakage and shows several distinguished studies, which introduce different kinds of information leakage from electronic devices via electromagnetic fields. Measurement/analysis methods of EM radiation correlated to the significant information of the devices are also presented.

10:30-11 a.m.
Electromagnetic Information Leakage for Side-Channel Analysis of Cryptographic Modules
N. Homma, Tohoku University, Sendai, Japan; T. Aoki, Tohoku University, Sendai, Japan; A. Satoh, National Institute of Advanced Industrial Science and Technology, Chiyoda-ku, Japan

11-11:30 a.m.
Development of an On-Chip Micro Shielded-Loop Probe to Evaluate Performance of Magnetic Film to Protect a Cryptographic LSI from Electromagnetic Analysis
M. Yamaguchi, Tohoku University, Sendai, Japan; H. Toriduka, Tohoku University, Sendai, Japan; S. Kobayashi, Tohoku University, Sendai, Japan; T. Sugawara, Tohoku University, Sendai, Japan; N. Homma, Tohoku University, Sendai, Japan; T. Aoki. Tohoku University, Sendai, Japan; A. Satoh, Advanced Industrial Science and Technology, Chiyoda-ku, Japan

11:30-noon
Information Leakage from Cryptographic Hardware Via Common-Mode Current
Y. Hayashi, Tohoku University, Sendai, Japan; T. Sugawara, Tohoku University, Sendai, Japan; Y. Kayano, Akita University, Akita, Japan; N. Homma, Tohoku University, Sendai, Japan; T. Mizuki, Tohoku University, Sendai, Japan; A. Satoh, National Institute of Advanced Industrial Science and Technology, Tokyo, Japan; T. Aok. Tohoku University, Sendai, Japan; S. Minegishi, Tohoku Gakuin University, Tagajyo, Japan; H. Sone, Tohoku University, Sendai, Japan; H. Inoue, Akita University, Akita, Japan

Sponsored by TC5

Cavities and Statistics
TU-AM-5 | Room 203/204

Chairs: Dr. Chris Holloway, NIST and Dr. Marina Koledintseva, Missouri University of Science & Technology

10:30-11 a.m.
Maximum Levels inside an Electromagnetic Shielded Cavity
M. Hoijer, Swedish Defence Research Agency FOI, Linkping, Sweden

11-11:30 a.m.
Statistics Use for Radiated High Frequency Failures
E. Garcia, EADS ASTRIUM Space Transportation, Les Mureaux, France

11:30-noon
On Radiated Susceptibility Testing of Highly Directive Devices
V. Rajamani, C. Bunting, Oklahoma State University, Stillwater, U.S.A.

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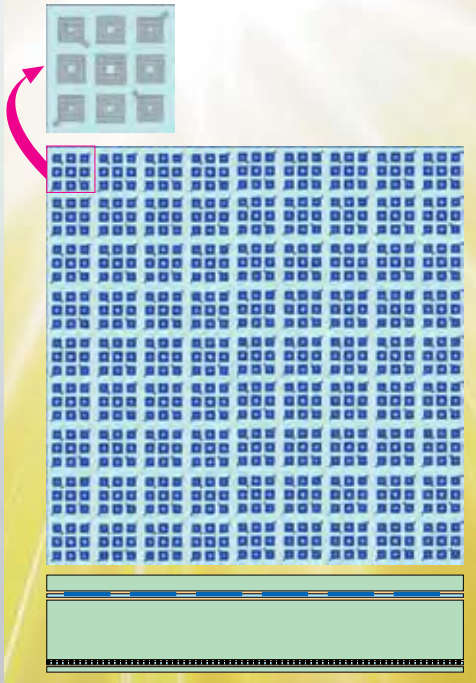
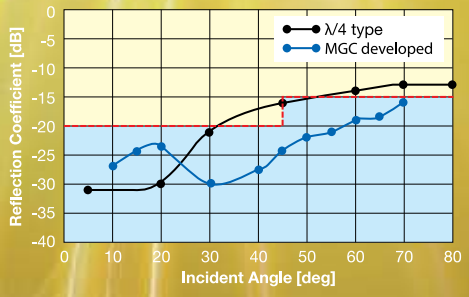


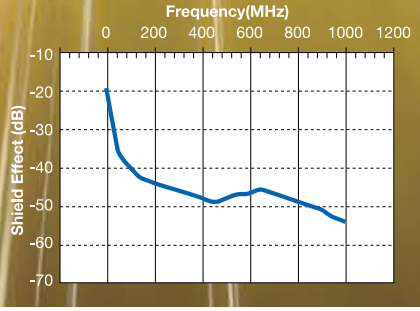


Hi-Direc High Dielectric Constant Resin

High Dielectric Material

properties	unit	HD-β19	HD-β29
Dielectric Constant (1GHz)		9	18
Dielectric Dissipation Factor (1GHz)		0.008	0.015
Specific Gravity		1.4	1.5
Flexural Strength	MPa	64	53
Flexural Modulus	GPa	4.7	5.9
Water Absorption	%	0.05	0.05
Melt Viscosity (300 ℃, 1000cm^{-1})	Pa·s	180	220

FILSHIELD Transparent Shield Film/Sheet



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AFTERNOON SESSIONS 1:30 PM-5 PM

Measurements 1
TU-PM-1 | Room 223/222

Chair: Don Heirman, Don HEIRMAN Consultants

1:30–2 p.m.
Radiated Spurious Emissions Measurement by Substitution Method
Q. Yu, Alcatel-Lucent, Columbus, U.S.A.

2–2:30 p.m.
A new Measuring Setup for the Characterization of Conductive Gaskets up to 18 GHz
J. Catrysse, K.U. Leuven, Heverlee, Belgium; F. Vanhee, Khbo, Oostende, Belgium; D. Pissoort, Khbo, Oostende, Belgium; C. Brull, Schlegel Electronic Materials, Leffinge, Belgium

2:30–3 p.m.
Implementation of an In-Situ Near-Field Emissions Measurement System
C. Osterwise, S. L. Grant, D. Beetner, Missouri S&T, Rolla, U.S.A.

Break

3:30–4 p.m.
A Critical Assessment of the Closed-Loop Bulk Current Injection Immunity Test Performed in Compliance with ISO 11452-4
P. S. Crovetti, F. Fiori, Politecnico di Torino, Torino, Italy

4-4:30 p.m.
Frequency Phenomenon and Algorithms for Arc Detection
K. O. Phipps, D. D. Dorr, T. S. Cooke, P. F. Keebler, Electric Power Research Institute, Knoxville, U.S.A.

4:30-5 p.m.
New Radiated Immunity/Susceptibility Test Method Using Rotating FM-EM Field
K. Murano, Tokai University, Hiratsuka, Japan; M. Tayarani, Iran University of Science and Technology, Narmak, Iran; F. Xiao, University of Electro-Communications, Chofu, Japan; Y. Kami, University of Electro-Communications, Chofu, Japan

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Nanotechnology & Advanced Materials
TU-PM-2 | Room 221/220

Chairs: Dr. Chris Holloway, NIST & Dr. Marina Koledintseva, Missouri University of Science & Technology

1:30–2 p.m.
EMI Shielding Effects of Carbon Nanotubes on Traditional EMI Plastics
N. Bryant, RTP Company, Winona, U.S.A.

2–2:30 p.m.
EMI Shielding Effects of Carbon Nanotube Cellulose Nanocomposite
P. Moilanen, University of Jyvaskyla, Finland; M. Luukkainen, Nokia Corporation, Tampere, Finland; J. Jekkonen, ITIS Foundation, Zurich, Switzerland; V. Kangas, University of Jyvaskyla, Finland

2:30–3 p.m.
Electromagnetic Absorbing Nanocomposites Including Carbon Fibers, Nanotubes and Graphene Nanoplatelets
M. Sarto, Sapienza University of Rome, Rome, Italy; G. De Bellis, Sapienza University of Rome, Rome, Italy; A. Dinescu, National Institute for Research and Development in Microtechnologies, Bucharest, Romania; A. Tamburrano, Sapienza University of Rome, Rome, Italy; I. M. De Rosa, Sapienza University of Rome, Rome, Italy;

Break

3:30–4 p.m.
Broadband Characterization of Carbon Nanotube Networks
E. Decrossas, University of Arkansas, Fayetteville, U.S.A.; M. A. EL Sabbagh, University of Arkansas, Fayetteville, U.S.A.; S. M. El-Ghazaly, University of Arkansas, Fayetteville, U.S.A.; V. Fouad Hanna, University Pierre et Marie Curie, Paris, France

4-4:30 p.m.
Comparative Analysis of TL Models for Multilayer Graphene Nanoribbon and Multiwall Carbon Nanotube Interconnects
M. Sarto, A. Tamburrano, Sapienza University of Rome, Rome, Italy

Sponsored by TC11

PCB Concerns
TU-PM-3 | Room 209/210

Chairs: John Archer, Retired & Philip Keebler, EPRI

1:30–2 p.m.
Spurious Emission from Microstrip Oscillator Circuit
H. Hsieh, National Taiwan University, Taipei, Taiwan; J. Chen, BSMI, Taipei, Taiwan; C. Wang, National Taiwan University, Taipei, Taiwan; C. Chiu, Da-Yeh University, Changhua, Taiwan; M. Lin, National Yunlin University, Yunlin, Taiwan; C. Chen, National Taiwan University, Taipei, Taiwan

2–2:30 p.m.
On Chip Filtering Versus Layout Techniques to Reduce RF Coupled Disturbances
P. Schrater, F. Klotz, Infineon Technologies AG, Neubiberg, Germany

2:30–3 p.m.
Simulation and Design of Printed Circuit Boards Utilizing Novel Embedded Capacitance Material
X. Yu, Huawei Technologies Co., Ltd, Shanghai, China

Break

AFTERNOON SESSIONS 1:30 PM-5 PM

3:30–4 p.m.
Limit and Use of Near-Field Scan for Platform RFI Analysis
J. Koo, J. A. Mix, K. P. Slattery, Intel Corporation, Hillsboro, U.S.A.

4-4:30 p.m..
Reduction of Heatsink Emissions by Application of Lossy Materials
E. Chikando, S. Connor, B. Archambeault, IBM, Durham, U.S.A.

Sponsored by TC4

SPECIAL SESSION: EM Information Leakage
TU-PM-4 | Room 207/208

Chair: Dr. Tetsuya Tominaga, NTT Corporation & Dr. William Radasky, Metatech Corporation

Abstract
This special session presents an overview of the research trends related to information leakage and shows several distinguished studies, which introduce different kinds of information leakage from electronic devices via electromagnetic fields. Measurement/analysis methods of EM radiation correlated to the significant information of the devices are also presented.

1:30–2 p.m.
ElectroMagnetic Attacks Case Studies on Non-Protected and Protected Cryptographic Hardware Accelerators
L. Sauvage, O. Meynard, S. Guilley, J. Danger, Telecom ParisTech, Paris, France

2–2:30 p.m.
An Improved Technique to Discover Compromising Electromagnetic Emanations
M. Vuagnoux, S. Pasini, EPFL, Lausanne, Switzerland

2:30–3 p.m.
Information leakage of input operation on touch screen monitors caused by electromagnetic noise
H. Sekiguchi, Osaka University, Osaka, Japan

Break

3:30–4 p.m.
Jamming Technique to Prevent Information Leakage Caused by Unintentional Emissions of PC Video Signals
Y. Suzuki, Y. Akiyama, NTT Energy and Environment Systems Laboratories, Musashino-shi, Japan

4-4:30 p.m.
Countermeasure for Electromagnetic Screen Image Leakage based on Color Mixing in Human Brain
T. Watanabe, Hitachi Ltd., Tokyo, Japan; H. Nagayoshi, Hitachi Ltd., Tokyo, Japan; T. Urano, Hitachi Ltd., Tokyo, Japan; T. Uemura, Hitachi-Omron Terminal Solutions, Corp., Aichi-ken, Japan; H. Sako, Hitachi Ltd., Tokyo, Japan

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High Power and Time Domain Simulation
TU-PM-5 | Room 203/204

Chair: Sam Connor, IBM & Dr. Alan Roden, Aerospace Corp

1:30–2 p.m.
Investigation on Electromagnetic Responses of Double Objects Illuminated by a High-Power EMP using Hybrid TDIE-TDPO Method
M. Zhu, Center for Microwave and RF Technologies (CMRFT),Shanghai Jiao Tong University, Shanghai, China; X. Zhou, Center for Microwave and RF Technologies(CMRFT),Shanghai Jiao Tong University, Shanghai, China; W. Yin, Center for Optical and EM Research (COER), State Key Lab of MOI,Zhe Jiang University, Hangzhou, China

2–2:30 p.m.
Analysis of Radio Interference due to Corona along 1000kV AC Transmission Lines
Y. Zou, T. Lu, Z. Zhao, X. Zhou, G. Xiong, North China Electric Power University, Baoding, China

2:30–3 p.m.
Fast Calculation of Dielectric Substrate Losses in Microwave Applications by the FD2TD Method using a New Formalism
M. Feliziani, University of L'Aquila, L'Aquila, Italy; V. De Santis, University of L'Aquila, L'Aquila, Italy; C. Buccella, University of L'Aquila, L'Aquila, Italy; F. Maradei, Sapienza University of Rome, Rome, Italy

Break

3:30–4 p.m.
Transient FDTD Simulation Validation
R. I. Jauregui, Universitat Politecnica de Catalunya , Barcelona, Spain; R. Pere, Universitat Politecnica de Catalunya, Barcelona, Spain; F. Silva, Universitat Politecnica de Catalunya, Barcelona, Spain

4-4:30 p.m.
Transient perturbation analysis in Digital Radio
R. I. Jauregui, Universitat Politecnica de Catalunya , Barcelona, Spain; M. Pous, Universitat Politecnica de Catalunya , Barcelona, Spain; M. Fera¡ndez, Universitat Politecnica de Catalunya , Barcelona, Spain; F. Silva, Universitat Politecnica de Catalunya, Barcelona, Spain

4:30-5 p.m.
Evaluation of Propagation Characteristics for PCB Traces with Periodic Roughness Using ASM-FDTD Method
M. Wang, University of Houston, Houston, U.S.A.; R. Qiang, University of Houston, Houston, U.S.A.; J. Chen, University of Houston, Houston, U.S.A.; M. Y. Koledintseva, Missouri University of Science and Technology, Rolla, U.S.A.; J. L. Drewniak, Missouri University of Science and Technology, Rolla, U.S.A.

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MORNING SESSIONS 8:30 AM-NOON

WEDNESDAY INCLUDES:*

Technical Paper Sessions

- Antenna 2
- HPEM
- Radiation Coupling and EMI
- Signal Integrity I
- PCB Simulation
- Filtering, Automotive, & Cable Concerns
- Measurement 2
- Reverberation 1

Special Sessions

- Hybrid Techniques for EMC Analysis
- Multi-Gbps Interconnect Simulation and Measurement

Poster Paper Session 1 Display

Poster Paper Session 2

- Display board preparation, set up and display

Global EMC University (Page 54)

Exhibit Hall & Demonstrations

Meetings

- TC-3 Electromagnetic Environment (Page 52)
- TC-4 Electromagnetic Interference Control (Page 52)
- TC-5 High Power Electromagnetics (Page 52)
- TC-10 Signal Integrity (Page 52)
- TC-11 Nanotechnology (Page 52)

Other Events

- Jr. Technical Program (Page 15)
- Job Fair (Page 57)
- PSES Colloquium (Page 55)
- Founders Luncheon (Page 58)
- Gala Evening Event (Page 58)

Tours

- Shop Till You Drop (Page 61)
- South Beach, Miami (Page 64)
- Las Olas Boulevard (Page 64)

Antenna 2
WED-AM-1 | Room 223/222

Chair: Werner Schaefer, CISCO

8:30–9 a.m.
Influence of Antenna Pattern on Site Validation above 1 GHz for Site VSWR Measurements
F. Trautnitz, J. Riedelsheimer, Albatross Projects GmbH, Nattheim, Germany

9–9:30 a.m.
A Reference Antenna Method for Non-resonant Electrically Short Monopole Antennas
M. Ishii, Y. Shimada, National Institute of Advanced Industrial Science and Technology, National Metrology Institute of Japan, Tsukuba, Japan

9:30–10 a.m.
Aperture Coupling Near-Field Cavity Effects for Electromagnetic Testing with Measurements on a Slotted Circular Cylinder
M. L. Waller, Redstone Test Center (P), Redstone Arsenal, U.S.A.; T. H. Shumpert, Redstone Test Center (P), Redstone Arsenal, U.S.A.; R. W. Scharstein, University of Alabama, Tuscaloosa, U.S.A.

Break

10:30–11 a.m.
Characterization of the Bulk Current Injection Calibration-Jig for Probe-Model Extraction
F. Grassi, S. A. Pignari, Politecnico di Milano, Milano, Italy

11-11:30 a.m.
Dependence of the Time- and Frequency-Domain Response of BCI Injection Probes on the Common Mode Characteristic Impedance of the Cable Bundle
J. McLean, R. Sutton, TDK R&D Corp., Cedar Park, U.S.A.

11:30-noon
Improvements in GMI Probe Design for Time-Domain Transient Current Measurements
F. Zhou, S. Wu, D. Pommerenke, Missouri University of Science and Technology, Y. Kayano, H. Inoue, Akita University, K. Tan, Akita Research and Development Center

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HPEM
WED-AM-2 | Room 221/220

Chairs: Dr. William Radasky, Metatech Corporation & Michael McInerney, U.S. Army Engineer Research and Development Center

8:30–9 a.m.
Systematic Design Technique for Improvements of Mobile Phone's™ Immunity

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

MORNING SESSIONS 8:30 AM-NOON

to Electrostatic Discharge Soft Failures
K. Kim, J. Koo, B. Kang, S. Kwon, Y. Kim, J. Jeong, Advanced CAE Lab., Suwon, Republic of Korea

9–9:30 a.m.
Model for ESD LCD Upset of a Portable Product
J. Xiao, EMC lab, Rolla, U.S.A.; D. Pommerenke, EMC lab, Rolla, U.S.A.; F. Zhou, EMC lab, Rolla, U.S.A.; J. Drewniak, EMC lab, Rolla, U.S.A.; H. Shumiya, Sony Corporation, Tyoko, Japan; T. Yamada, Sony Corporation, Tyoko, Japan; K. Araki, Sony Corporation, Tyoko, Japan

9:30–10 a.m.
Effects of High-Power and Transient Disturbances on Wireless Communication Systems Operating Inside the 2.4 GHz ISM Band
C. Kluender, J. L. ter Haseborg, Hamburg University of Technology, Hamburg, Germany

Break

10:30–11 a.m.
The Investigation of Measurement Method for HPM Radiation to the Analog Switch Chip
M. Yoo, University of Seoul, Seoul, Republic of Korea; W. Kim, University of Seoul, Seoul, Republic of Korea; Y. Park, Seoul National University, Seoul, Republic of Korea; M. Kim, Seoul National University, Seoul, Republic of Korea; Y. Chung, Kwangwoon University, Seoul, Republic of Korea; H. Kim, Seoul National University, Seoul, Republic of Korea; C. Cheon, University of Seoul, Seoul, Republic of Korea

11-11:30 a.m.
Effect of Ionosphere to Lightning Radiation Field
Z. Zhao, T. Lu, North China Electric Power University, Beijing, China

11:30-noon
Effects of Channel Length on Calculation Accuracy of Lightning Return Stroke Electromagnetic Fields
T. Ding, S. Zhang, Q. Wu, Harbin Institute of Technology, Harbin, China

Sponsored by TC5

SPECIAL SESSION: Hybrid Techniques for EMC Analysis
WED-AM-3 | Room 209/210

Chairs: Dr. Albert Ruehli, Missouri University of Science & Technology & Dr. Guilio Antonini, Univeristy of L'Aquila

Abstract
Today, the electrical analysis of many large real-world EMC systems has to be carried out by mea ns of numerical full-wave techniques. However, because of the complexity of today's electronic and electrical equipment, this approach remains time and memory intensive. Hence, modeling by only one technique may not be possible since the single technique approach is usually consumes too much time and memory. In order to overcome this limitation, hybrid techniques have been successfully adopted. This special session aims to introduce some state-of-the-art approaches for the modeling of complex electromagnetic systems by the applications of hybrid techniques.

8:30–9 a.m.
Parameterized Model Order Reduction with Guaranteed Passivity for PEEC Circuit Analysis
F. Ferranti, Ghent University, Gent, Belgium; G. Antonini, University of L'Aquila, L'Aquila, Italy; T. Dhaene, Ghent University, Gent, Belgium; L. Knockaert, Ghent University, Gent, Belgium

9–9:30 a.m.
Efficient Signal and Power Integrity Analysis by Using Modal Decomposition and Integral Equations
*X. Wei, E. Li, E. Liu, A*STAR Institute of High Performance Computing, Fusionopolis, Singapore*

9:30–10 a.m.
Efficient Macromodeling of Power-Bus Structures Based on 2D-Integral Equation Approach
M. Leone, O. Kroening, OvG-University Magdeburg, Magdeburg, Germany

Break

10:30–11 a.m.
An Electromagnetics-Based Parallel Transient Simulator of Linear Complexity for the Analysis of Very Large-Scale Integrated Circuits and Packages
D. Chen, D. Jiao, Purdue University, West Lafayette, U.S.A.

11-11:30 a.m.
Hybrid Method Used to Model Via Transitions
H. Wang, A. Ruehli, J. Fan, Missouri University of Science and Technology, Rolla, U.S.A.

11:30-noon
Next-Generation Three-Dimensional Full-Wave Electromagnetic Solver Hybridization for Large-Scale Signal Integrity, Power Integrity, and EMI Modeling
V. Jandhyala, University of Washington, Seattle, U.S.A.; S. Chakraborty, Physware, Inc., Bellevue, U.S.A.; D. Gope, Physware, Inc., Bellevue, U.S.A.

Sponsored by TC9

MORNING SESSIONS 10:30 AM-NOON

Radiation Coupling and EMI
WED-AM-4 | Room 207/208

Chairs: David Larrabee, East Stroudsburg University & Kermit Phipps, EPRI

8:30–9 a.m.
Prediction of EMI from Two-Channel Differential Signaling System Based on Imbalance Difference Model
T. Matsushima, Kyoto University, Kyoto, Japan; T. Watanabe, Industrial Technology Center of Okayama Prefecture, Okayama, Japan; Y. Toyota, Okayama University, Okayama, Japan; R. Koga, Okayama University, Okayama, Japan; O. Wada, Kyoto University, Kyoto, Japan

9–9:30 a.m.
Study of Mutual Coupling on Mobile Phone PCB with Shielding Using FDTD
C. Li, ETH Zurich, Zurich, Switzerland; J. Jekkonen, Schmid & Partner Engineering AG (SPEAG), Zurich, Switzerland; G. Tudosie, Schmid & Partner Engineering AG (SPEAG), Zurich, Switzerland; N. Chavannes, Schmid & Partner Engineering AG (SPEAG), Zurich, Switzerland; N. Kuster, ETH Zurich, Zurich, Switzerland

9:30–10 a.m.
Knowledge-based Approach to Interference Mitigation for EMC of Transceivers on Unmanned Aircraft
I. Demirkiran, Embry-Riddle Aeronautical University , Daytona Beach, U.S.A.; D. D. Weiner, Syracuse University, Syracuse, U.S.A.; A. Drozd, ANDRO Computational Solutions, Rome, U.S.A.; I. Kasperovich, ANDRO Computational Solutions, Rome , U.S.A.

Break

10:30–11 a.m.
New Insights on Loop Radiation Efficiency
D. Moongilan, Bell Laboratories, Alcatel-Lucent, Murray Hill, U.S.A.

11-11:30 a.m.
Polarization Extraction Through the Linear Component Method
J. A. Nascimento, UFCG, Areia, Brazil; G. Fontgalland, UFCG, Campina Grande, Brazil; R. M. Valle, UFCG, Campina Grande, Brazil

11:30-noon
Effects of a Wire beneath the Ground Plane on Antenna Coupling through a Slot
T. Morioka, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan; K. Hirasawa, University of Tsukuba, Tsukuba, Japan

Sponsored by TC4

Signal Integrity I
WED-AM-5 | Room 203/204

Chairs: Dr. Marina Koledintseva, University of Missoury Science & Technology & Dr. Jianmin Zhang, CISCO

8:30–9 a.m.
Improved Target Impedance and IC Transient Current Measurement for Power Distribution Network Design
J. Kim, Missouri University of Science and Technology, Rolla, U.S.A.; S. Wu, Missouri University of Science and Technology, Rolla, U.S.A.; H. Wang, Missouri University of Science and Technology, Rolla, U.S.A.; Y. Takita, Sony Corporation, Tokyo, Japan; H. Takeuchi, Sony Corporation, Tokyo, Japan; K. Araki, Sony Corporation, Tokyo, Japan; G. Feng, Research In Motion, Waterloo, Canada; J. Fan, Missouri University of Science and Technology, Rolla, U.S.A.

9–9:30 a.m.
Differential Signal Via Shield with Narrow Via Pitch Partial Electromagnetic Bandgap Structure
C. Hwang, M. Shin, J. S. Pak, J. Kim, KAIST, Deajeon, Republic of Korea

9:30–10 a.m.
Equivalent Transmission-Line Model for Vias Connected to Striplines in Multilayer Print Circuit Boards
S. Pan, Missouri University of Science and Technology, Rolla, U.S.A.; J. Zhang, Cisco Systems, Inc., San Jose, U.S.A.; Q. B. Chen, Cisco Systems, Inc., San Jose, U.S.A.; J. Fan, Missouri University of Science and Technology, Rolla, U.S.A.

Break

10:30–11 a.m.
Off-Phase Crosstalk Behaviour and Design Considerations for High-Speed Memory Buses
A. J. Chen, Intel Corporation, Santa Clara, U.S.A.; H. Wang, Intel Corporation, Chandler, U.S.A.

11-11:30 a.m.
Design and Modeling for Chip-to-Chip Communication at 20 Gbps
J. Zhang, Cisco Systems, Inc, San Jose, U.S.A.; Q. B. Chen, Cisco Systems, Inc, San Jose, U.S.A.; K. Qiu, Cisco Systems, Inc, San Jose, U.S.A.; A. C. Scogna, CST of America, Framingham, U.S.A.; M. Schauer, CST of America, Framingham, U.S.A.; G. Romo, CST of America, Framingham, U.S.A.; J. L. Drewniak, Missouri University of Science and Technology, Rolla, U.S.A.; A. Orlandi, University of L'Aquila, L'Aquila, Italy

11:30-noon
An Evaluation of the Immunity Characteristics of an LSI with Capacitors Embedded in an Interposer
C. Sasaki, Panasonic Corporation, Kadoma City, Japan; Y. Saito, Panasonic Corporation, Kadoma City, Japan; E. Takahashi, Panasonic Corporation, Kadoma City, Japan; Y. Sugaya, Panasonic Electronic Devices Co., Ltd., Kadoma City, Japan; H. Kobayashi, Panasonic Electronic Devices Co., Ltd., Kadoma City, Japan

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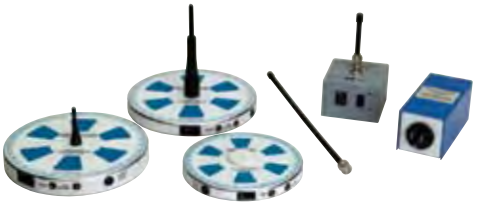

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AFTERNOON SESSIONS 1:30 PM-5 PM

Measurement 2
WED-PM-1 | Room 223/222

Chair: Bob Hofmann, Hofmann EMC Engineering

1:30–2 p.m.
Time-Domain Measurement Method to Guard Against Pre-amplifier Saturation
M. J. Jackson, DENSO International America, Inc., Southfield, U.S.A.

2–2:30 p.m.
Modeling of the Immunity of ICs to EFTs
J. Zhang, Missouri University of Science and Technology, Rolla, U.S.A.; J. Koo, Intel Corporation, Hillsboro, U.S.A.; D. Beetner, Missouri University of Science and Technology, Rolla, U.S.A.; R. Moseley, Freescale Semiconductor, Inc., Austin, U.S.A.; S. Herrin, Freescale Semiconductor, Inc., Austin, U.S.A.; D. Pommerenke, Missouri University of Science and Technology, Rolla, U.S.A.

2:30–3 p.m.
Spectral Analysis of Conducted Emissions of DC/DC converters
D. Bellan, Politecnico di Milano, Milano, Italy; F. Marliani, European Space Agency - ESTEC, Noordwijk, Netherlands; S. A. Pignari, Politecnico di Milano, Milano, Italy; G. Spadacini, Politecnico di Milano, Milano, Italy

Break

3:30–4 p.m.
Impact of RF Interference between a Passive RFID System and a Frequency Hopping Communications System in the 900 MHz ISM Band
M. R. Souryal, D. R. Novotny, D. G. Kuester, J. R. Guerrieri, K. A. Remley, National Institute of Standards and Technology, Boulder, U.S.A.

4-4:30 p.m.
Influence of Planar Sampling Techniques of Near Field Magnitude-only Data on Predicting Far Field Radiation of PCBs by Genetic Algorithms
H. Fan, F. Schlagenhaufer, The University of Western Australia, Crawley, Australia

4:30-5 p.m.
Measurement of RF Current Waveform of a Source Driver Chip Used in a Liquid Crystal-TV Display Panel
S. Kobayashi, H. Torizuka, S. Dhungana, M. Yamaguchi, Tohoku Univiersity, Sendai, Japan

5-5:30 p.m.
Designing Shielding Boxes made of Conductive Plastics using a new Joining Structure
J. Catrysse, K.U. Leuven, Heverlee, Belgium; F. Vanhee, Khbo, Oostende, Belgium; D. Pissoort, Khbo, Oostende, Belgium; R. Dewitte, Bekaert , Zwevegem, Belgium; D. Hellert, Bekaert, Idstein, Germany

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Reverberation 1
WED-PM-2 | Room 221/220

Chairs: Diane Kempf, NAVAIR & Dr. William Radasky, Metatech Corporation

1:30–2 p.m.
Evaluation of Uncorrelation and Statistics inside a Reverberation Chamber in Presence of Two Independent Stirrers
F. Moglie, V. Mariani Primiani, Universita` Politecnica delle Marche, Ancona, Italy

2-2:30 p.m.
Studying the Pulse Regime in a Reverberation Chamber with a Model Based on Image Theory
E. Amador, Insa de Rennes, Rennes, France; C. Lemoine, Insa de Rennes, Rennes, France; P. Besnier, Insa de Rennes, Rennes, France; A. LaisnÃ, Direction GÃnÃrale de l'Armement, Balma, France

2:30–3 p.m.
Stirrer Blade Separation Experiment in Reverberation Chambers
O. Lunden, Swedish Defence Research Agency, FOI, Sweden, Linkoping, Sweden; N. Wellander, Swedish Defence Research Agency, FOI, Sweden, Linkoping, Sweden; M. Backstrom, Combitech AB, Sweden, Linkoping, Sweden

Break

3:30–4 p.m.
Examining the True Effectiveness of Loading a Reverberation Chamber: How to Get Your Chamber Consistently Loaded
J. B. Coder, University of Colorado, Denver, U.S.A.; J. M. Ladbury, National Institute of Standards and Technology, Boulder, U.S.A.; C. L. Holloway, National Institute of Standards and Technology, Boulder, U.S.A.; K. A. Remley, National Institute of Standards and Technology, Boulder, U.S.A.

4-4:30 p.m.
Yet Another Antenna Efficiency Measurement Method in Reverberation Chambers
H. G. KrauthÃuser, TU Dresden, Dresden, Germany; M. Herbrig, emv GmbH, Taufkirchen, Germany

4:30-5 p.m.
Double-Weibull Distributions of the Re-Emission Spectra from a Non-Linear Device in a Mode Stirred Chamber
J. Chen, A. Marvin, I. Flintoft, J. Dawson, University of York, York, United Kingdom

5-5:30 p.m.
Determination of Reverberation Distance using Frequency and Time domain
V. Rajamani, C. Bunting, Oklahoma State University, Stillwater, U.S.A.

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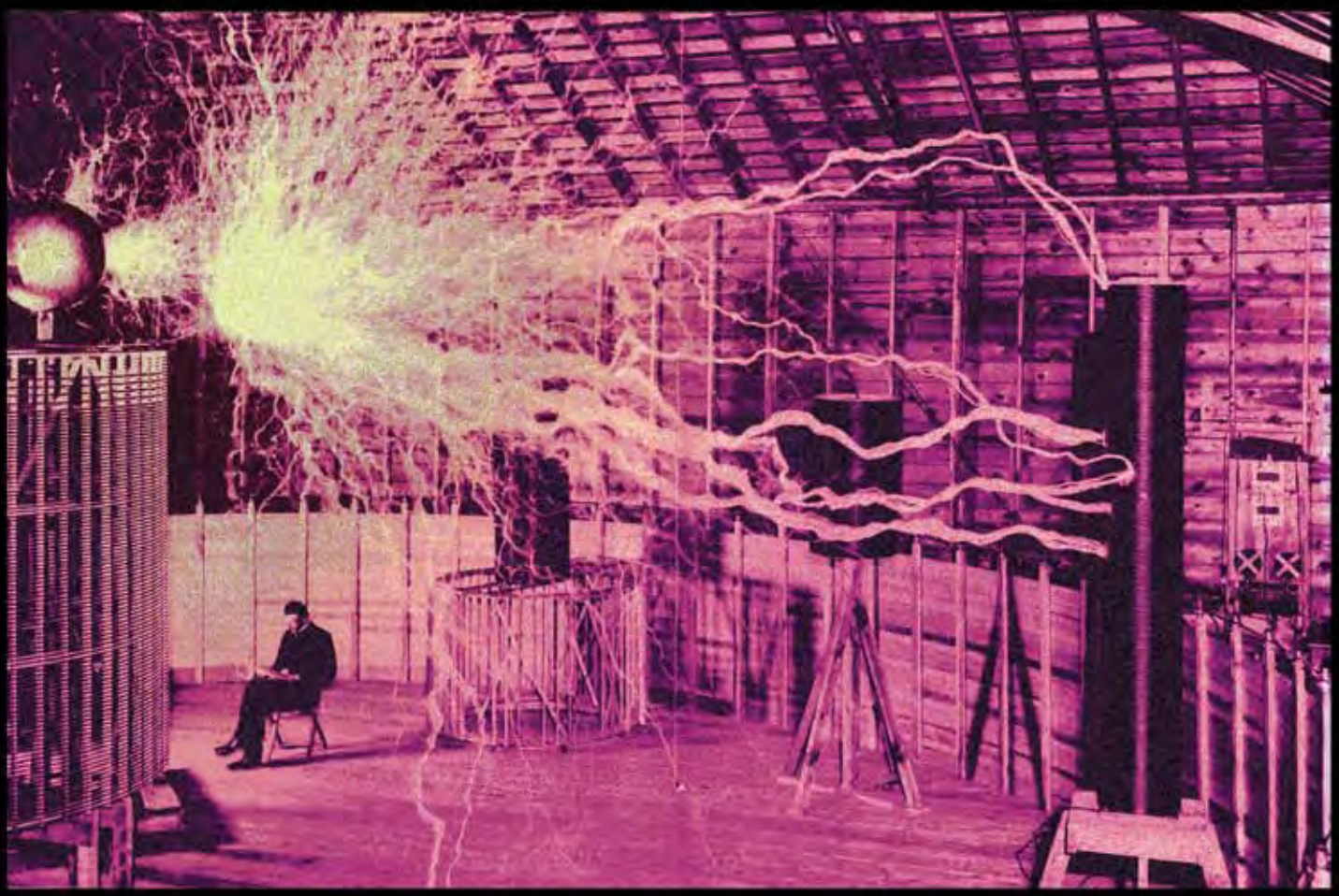

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AFTERNOON SESSIONS 1:30 PM-5 PM

SPECIAL SESSION: Multi-Gbps Interconnect Simulation and Measurement

WED-PM-3 | Room 209/210

Chairs: Dr. Xiaoning Ye, Intel Corporation & Dr. Antonio Ciccomancini, CST

Abstract

This special session intends to address recent advances in Signal Integrity and Power Integrity in mUlti-GBps interconnects. As data rate ever increases, Signal Integrity and Power Integrity design is getting more and more critical, and simulation analysis is getting more and more challenging. We will have authors from both industry and academia to share their experiences in both areas, as well as how SI and PI interact with each other.

1:30–2 p.m.

Analyzing Via Impedance Variations with a Stochastic Collation

J. Shen, University of Houston, Houston, U.S.A.; H. Wang, Missouri University of Science and Technology, Rolla, U.S.A.; J. Chen, University of Houston, Houston, U.S.A.; J. Fan, Missouri University of Science and Technology, Rolla, U.S.A.

2–2:30 p.m.

DC Blocking Via Structure Optimization and Measurement Correlation for SerDes Channels

J. Zhang, CISCO Systems, Inc., San Jose, U.S.A.; Q. B. Chen, CISCO Systems, Inc., San Jose, U.S.A.; J. Fan, Missouri University of Science and Technology, Rolla, U.S.A.; J. L. Drewniak, Missouri University of Science and Technology, Rolla, U.S.A.; A. Orlandi, University of L'Aquila, L'Aquila, Italy; B. Archambeault, IBM Corp., Raleigh, U.S.A.

2:30–3 p.m.

Efficient Time-Domain Vector Fitting for Broad-band interconnect Modeling

S. Moon, Intel, Hillsboro, U.S.A.; X. Ye, Intel, Hillsboro, U.S.A.; A. Cangellaris, University of Illinois at Urbana-Champaign, Urbana, U.S.A.

Break

3:30–4 p.m.

Stressed Jitter Analysis for Physical Link Characterization

N. Radhakrishnan, Cisco Systems, Inc., San Jose, U.S.A.; B. Achkir, Cisco Systems, Inc., San Jose, U.S.A.; J. Fan, Missouri University of Science and Technology, Rolla, U.S.A.; J. L. Drewniak, Missouri University of Science and Technology, Rolla, U.S.A.

4-4:30 p.m.

Analysis of Coupling-Induced Jitter in FPGA Transceiver

K. Chand, Altera Corporation, San Jose, U.S.A.; G. Liu, Nvidia Corporation, Santa Clara, U.S.A.; D. Chow, Nvidia Corporation, Santa Clara, U.S.A.

4:30-5 p.m.

Modeling the Impact of Return-Path Discontinuity on Interconnects for Gb/s Applications

I. Ndip, Fraunhofer IZM, Berlin, Germany

5-5:30 p.m.

Enabling Terabit Per Second Switch Linecard Design Through Chip/Package/PCB Codesign

Q. B. Chen, Cisco Systems, Inc, San Jose, U.S.A.; J. Zhang, Cisco Systems, Inc, San Jose, U.S.A.; K. Qiu, Cisco Systems, Inc, San Jose, U.S.A.; D. Padilla, Cisco Systems, Inc, San Jose, U.S.A.; Z. Yang, Cisco Systems, Inc, San Jose, U.S.A.; A. C. Scogna, CST of America, Framingham, U.S.A.; J. Fan, Missouri University of Science and Technology, Rolla, U.S.A.

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Filtering, Automotive, & Cable Concerns

WED-PM-4 | Room 207/208

Chairs: John Archer, Retired & Kermit Phipps, EPRI

1:30–2 p.m.

Noise Mitigation Analysis of a Pi-filter for an Automotive Control Module

C. Rostamzadeh, Bosch, Farmington Hills, U.S.A.; F. Canavero, Politecnico di Torino, Torino, Italy; F. Kashefi, Khavaran Institute of Science & Technology, Mashhad, Iran

2–2:30 p.m.

High Speed Data Cables with Lossy Material Coating

B. Archambeault, E. Chikando, J. Diepenbrock, S. Connor, IBM, Raleigh, U.S.A.

2:30-3 p.m.

Full-Wave Investigation of EFT Injection Clamp Calibration Setup

S. Caniggia, EMC Consultant, Bareggio (MI), Italy; E. Dudenhoeffen, Teseq , Luterbach, Switzerland; F. Maradei, Sapienza University, Rome, Italy

Break

3:30–4 p.m.

The Designing, Realization and Testing of a Network Filter used to Reduce Electromagnetic Disturbances and to Improve the EMI for Static Switching Equipment

P. T. Nicolae, University of Craiova, Craiova, Romania; G. Mihai, ICMET Craiova, Craiova, Romania; I. V. Nicolae,

AFTERNOON SESSIONS 1:30 PM-5 PM

University of Craiova, Craiova, Romania

4-4:30 p.m.
Rapid Simulation of the Statistical Variation of Crosstalk in Cable Harness Bundles
X. Li, Missouri University of Science and Technology, Rolla, U.S.A.; M. Wu, Amphenol Corporation, Nashua, U.S.A.; D. Beetner, Missouri University of Science and Technology, Rolla, U.S.A.; T. Hubing, Clemson University, Clemson, U.S.A.

4:30-5 p.m.
Automotive EMC Case Study: HMI Graphics Influence on Radiated Emissions
S. M. Mainville, Johnson Controls, Inc., Holland, U.S.A.

5-5:30 p.m.
Low Frequency Electromagnetic Field Reduction Techniques for the On-Line Electric Vehicle (OLEV)
S. Ahn, J. Pak, T. Song, H. Lee, J. Byun, D. Kang, C. Choi, E. Kim, J. Ryu, M. Kim, Y. Cha, Y. Chun, C. Rim, J. Yim, D. Cho, J. Kim, Korea Advanced Institute of Science and Technology, Daejeon, Republic of Korea

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PCB Simulation
WED-PM-5 | Room 203/204

Chairs: Dr. Vignesh Rajamani, Oklahoma State University & Dr. Antonio Ciccomancini, CST

1:30–2 p.m.
Network Model for the Analysis of Radiated Emissions from Horizontal PCB Submodules
M. Friedrich, M. Leone, Otto-von-Guericke University Magdeburg, Magdeburg, Germany

2–2:30 p.m.
High Speed Interconnects of Multi-layer PCB Analysis by Using Non-conformal Domain Decomposition Method
Y. Shao, Z. Peng, J. Lee, The Ohio State University, Columbus, U.S.A.

2:30–3 p.m.
EMI Circuit Modeling of a Power Train on Composite Ground Plane
N. Doorgah, Ampere laboratory umr-cnrs 5005, Ecully, France; C. Vollaire, Ampere laboratory umr-cnrs 5005, Ecully, France; F. Costa, Satie laboratory umr cnrs 8029, St Denis, France; N. Gazel, Company Hispano-Suiza, Moissy-Cramayel, France; R. Meuret, Company Hispano-Suiza, Moissy-Cramayel, France

Break

3:30–4 p.m.
An Equivalent Three-Dipole Model for IC Radiated Emissions Based on TEM Cell Measurements
S. Pan, Missouri University of Science and Technology, Rolla, U.S.A.; J. Kim, Missouri University of Science and Technology, Rolla, U.S.A.; S. Kim, LG PRI, Pyungtaek-si, Republic of Korea; J. Park, LG PRI, Pyungtaek-si, Republic of Korea; H. Oh, LG PRI, Pyungtaek-si, Republic of Korea; J. Fan, Missouri University of Science and Technology, Rolla, U.S.A.

4-4:30 p.m.
On the Radiated Electromagnetic Emission Modelling of On-Chip Microwave Components
A. Ramanujan, Z. Riah, A. Louis, B. Mazari, IRSEEM, Saint Etienne du Rouvray, France

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MORNING SESSIONS 8:30 AM-NOON

THURSDAY INCLUDES:*

Technical Paper Sessions

- Measurements 2 & Reverberation 3
- Capturing the Electromagnetic Environment 1
- Signal Integrity II
- Transmission Line Noise Concerns

Special Sessions

- Modeling/Simulation Validation

Poster Paper Session 2

- Display and meet the author

Global EMC University (Page 54)

Exhibit Hall & Demonstrations

Meetings

- Technical Advisory Committee (Page 52)

Other Events

- Jr. Technical Program (Page 15)
- Awards Luncheon (Page 58)
- PSES Colloquium (Page 55)
- Exhibitor Hospitality Night (Page 58)

Tours

- Japanese Gardens and Museums (Page 61)
- Riverfront Cruise (Page 65)
- Jungle Queen Dinner Cruise (Page 65)

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

Measurements 2 & Reverberation 3

TH-AM-1 | Room 223/222

Chairs: Dr. Galen Koepke, NIST & Bob Hofmann, Hofmann EMC Engineering

8:30–9 a.m.
Conductive Fabric SE Measurement in a Mode Stirred Reverberation Chamber
M. R. Pocai, Pisa, Italy; I. Dotto, CISAM, S. Piero a Grado, Italy; D. G. Festa, IBD, Chiari, Italy

9–9:30 a.m.
An Improved Model for Antennas in Reverberation Chambers
J. M. Ladbury, D. A. Hill, National Institute of Standards and Technology, Boulder, U.S.A.

9:30-10 a.m.
On the Use of a Reverberation Chamber to Test the Performance and the Immunity of a WLAN System
V. Mariani Primiani, Universita` Politecnica delle Marche, Ancona, Italy; F. Moglie, Universita` Politecnica delle Marche, Ancona, Italy; R. Recanatini, Universita` Politecnica delle Marche, Ancona, Italy

Break

10:30–11 a.m.
Modern Vessels and their Problems in EMC â€“ Examples in Practice
C. Kluender, Hamburg University of Technology, Hamburg, Germany; T. Pilsak, Hamburg University of Technology, Hamburg, Germany; J. L. ter Haseborg, Hamburg University of Technology, Hamburg, Germany; H. Hanneken, Meyer Werft GmbH, Papenburg, Germany

11-11:30 a.m.
Forward and Reverse Link Constraints in UHF RFID with Passive Tags
D. G. Kuester, NIST, Boulder, U.S.A.; D. R. Novotny, NIST, Boulder, U.S.A.; J. R. Guerrieri, NIST, Boulder, U.S.A.;

11:30-noon
Primary and Induced Currents from Cable Discharges
T. J. Maloney, Intel Corp

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Capturing the Electromagnetic Environment 1

TH-AM-2 | Room 221/220

Chairs: Dr. Randy Jost, Univeristy of Utah & David Hilton

8:30-9 a.m.
Multi-band Microstrip Antenna with Minimalization of Radiation towards Head
M. Wnuk, Military University of Technology, Warsaw, Poland

9–9:30 a.m.
Assessment of Emissions from Electrical Equipment Regarding Human Exposure Approaches for Application of the Generic Standard IEC 62311

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MORNING SESSIONS 8:30 AM-NOON

Capturing the Electromagnetic Environment 1

Continued from page 38

B. W. Jaekel, Siemens AG, Erlangen, Germany; A. N. Mladenovic, University of Nis, Nis, Yugoslavia; M. Peric, University of Nis, Nis, Yugoslavia; D. Vuckovic, University of Nis, Nis, Yugoslavia; N. Cvetkovic, University of Nis, Nis, Yugoslavia; S. Aleksic, University of Nis, Nis, Yugoslavia

9:30–10 a.m.
Low Frequency Electromagnetic Field Exposure Study with Posable Human Body Model
X. Chen, ITIS Foundation, Zurich, Switzerland; S. Benkler, SPEAG Schmid & Partner Engineering AG, Zurich, Switzerland; C. Li, ITIS Foundation, Zurich, Switzerland; N. Chavannes, SPEAG Schmid & Partner Engineering AG, Zurich, Switzerland; N. Kuster, ITIS Foundation, Zurich, Switzerland

Break

10:30–11 a.m.
Specific Absorption Rate Evaluation for People using Wireless Communication Device in Vehicle
K. Chan, S. Leung, Y. Siu, City University of Hong Kong, Hong Kong, Hong Kong

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SPECIAL SESSION: Modeling/Simulation Validation

TH-AM-3 | Room 209/210

Chairs: Dr. Andy Drozd, Andro Consulting & Dr. Bruce Archambeault, IBM

Abstract
This special session will explore the new modeling and simulation validation standard and explore the new Feature Selective Validation (FSV) technique for use in quantifying the quality of the agreement between the initial model result and the validation (whether measurements or other simulation).

8:30–9 a.m.
Antenna Co-Site Performance Analysis for Complex Systems Using Feature Selective Validation
I. Kasperovich, A. L. Drozd, A. A. Croneiser, C. E. Carroll, ANDRO Computational Solutions, LLC, Rome, U.S.A.

9–9:30 a.m.
Quantifying the Quality of Agreement between Data for Multiple Data Sets
B. Archambeault, IBM, Raleigh, U.S.A.; J. Diepenbrock, IBM, Raleigh, U.S.A.

9:30–10 a.m.
Applying Feature Selective Validation (FSV) as an Objective Function for Data Optimization
S. Pan, H. Wang, J. Fan, Missouri University of Science and Technology, Rolla, U.S.A.

Break

10:30–11 a.m.
Challenges in Developing a Multidimensional Feature Selective Validation Implementation
B. Archambeault, IBM, Raleigh, U.S.A.; A. Duffy, De Montfort University, Leicester, United Kingdom; H. Sasse, De Montfort University, Leicester, United Kingdom; X. Li, De Montfort University, Leicester, United Kingdom; M. Scase, De Montfort University, Leicester, United Kingdom; M. Shafiullah, De Montfort University, Leicester, United Kingdom; A. Orlandi, University of L'Aquila, L'Aquila, Italy; D. De Febo, University of L'Aquila, L'Aquila, Italy

11-11:30 a.m.
Comparison of Measured and Computed Near and Far Fields of a Heatsink using the Feature Selective Validation (FSV) Method
A. U. Bhobe, P. Sochoux, Cisco Systems, San Jose, U.S.A.

11:30-noon
Validating the FSV Method Using Reverberation Chamber Measurements
G. J. Hankins, D. Lewis, The Boeing Company, Seattle, U.S.A.

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Transmission Line Noise Concerns

TH-AM-4 | Room 207/208

Chairs: Michael McInerney, U.S. Army Engineer Research and Development Center & Fin O'Connor, Alion Science

8:30–9 a.m.
Modeling Connector Contact Condition Using a Contact Failure Model with Equivalent Inductance
Y. Hayashi, Tohoku University, Sendai, Japan; S. Wu, Missouri University of Science and Technology, Rolla, U.S.A.; J. Fan, Missouri University of Science and Technology, Rolla, U.S.A.; T. Mizuki, Tohoku University, Sendai, Japan; H. Sone, Tohoku University, Sendai, Japan

9–9:30 a.m.
Predicting CM Radiation from Strip Line Structure by Equivalent Circuit Model
Y. Kayano, H. Inoue, Akita University, Akita, Japan

9:30–10 a.m.
Lumped-Element Circuit Model of Ferrite Chokes
A. Orlando, Missouri University of Science and Technology,

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MORNING SESSIONS 8:30 AM-NOON

Transmission Line Noise Concerns
Continued from page 40

Rolla, U.S.A.; M. Y. Koledintseva, Missouri University of Science and Technology, Rolla, U.S.A.; D. G. Beetner, Missouri University of Science and Technology, Rolla, U.S.A.; P. Shao, Missouri University of Science and Technology, Rolla, U.S.A.; P. H. Berger, John Deere, Waterloo, U.S.A.

Break

10:30-11 a.m.
Far-End Crosstalk Reduction in Adjacent PCB Traces Employing High/Low-Z Configurations
M. J. Almalkawi, University of Toledo, Toledo, U.S.A.; Z. A. Khan, University of Toledo, Toledo, U.S.A.; V. Devabhaktuni, University of Toledo, Toledo, U.S.A.; C. Bunting, Oklahoma State University, Stillwater, U.S.A.

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Signal Integrity II
TH-AM-5 | Room 203/204

Chairs: Dr. Tzong-Lin Wu - National Taiwan University & Dr. Joungho Kim - KAIST Korea

8:30–9 a.m.
Experimental Validation of Common-Mode Filtering Performances of Planar Electromagnetic Band-gap Structures
F. de Paulis, UAQ EMC Laboratory, L'Aquila, Italy; L. Raimondo, UAQ EMC Laboratory, L'Aquila, Italy; D. Di Febo, UAQ EMC Laboratory, L'Aquila, Italy; B. Archambeault, IBM, Raleigh, U.S.A.; S. Connor, IBM, Raleigh, U.S.A.; A. Orlandi, UAQ EMC Laboratory, L'Aquila, Italy

9–9:30 a.m.
Equivalent Circuit Models for Evaluation of Bandgap Limits for Planar Electromagnetic Bandgap Structures
F. de Paulis, UAQ EMC Laboratory, L'Aquila, Italy; L. Raimondo, UAQ EMC Laboratory, L'Aquila, Italy; A. Orlandi, UAQ EMC Laboratory, L'Aquila, Italy; L. Ren, Missouri University of Science & Technology, Rolla, U.S.A.; J. Fan, Missouri University of Science & Technology, Rolla, U.S.A.

9:30–10 a.m.
An Ultra Compact Common-Mode Filter for RF Interference Control in 3G Wireless Communication Systems
I. Ao Ieong, C. Tsai, T. Wu, National Taiwan University, Taipei, Taiwan

Break

10:30–11 a.m.
Radiating Emissions from the Planar Electromagnetic Band-gap (EBG) Structures
B. Mohajer-Iravani, EMWaveDev, Fayetteville, U.S.A.; O. M. Ramahi, University of Waterloo, Waterloo, Canada

11-11:30 a.m.
Systematic Analysis of the Signal Integrity Performances of Surface Integrated Waveguides
A. Ciccomancini Scogna, CST, Framingham, U.S.A.; A. Orlandi, University of L'Aquila, L'Aquila, Italy

11:30-noon
Surface Impedance Approach to Calculate Loss in Rough Conductor Coated with Dielectric Layer
M. Y. Koledintseva, Missouri University of Science and Technology (MS&T), Rolla, U.S.A.; A. Koul, Missouri University of Science and Technology (MS&T), Rolla, U.S.A.; F. Zhou, Missouri University of Science and Technology (MS&T), Rolla, U.S.A.; J. L. Drewniak, Missouri University of Science and Technology (MS&T), Rolla, U.S.A.; S. Hinaga, CISCO Systems, Inc., San Jose, U.S.A.

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Booth 408

AFTERNOON SESSIONS 3:30 PM-5 PM

Special Topics
TH-PM-1 | Room 223/222

Chair: Larry Cohen, Naval Research Labs

3–3:30 p.m.
Investigations of the EM-Coupling in the Near and Far Field of a transmitting antenna according to EUROCAE ED-130
T. Dyballa, J. ter Haseborg, Hamburg University of Technology, Hamburg, Germany

3:30–4 p.m.
Including EMC in Risk Assessments
K. Armstrong, Cherry Clough Consultants, Stafford, United Kingdom

4–4:30 p.m.
Analysis on Coexistence of UWB with IEEE802.11n
Z. Li, F. Zhao, Z. Zhou, W. Zou, B. Li, C. Zhao, Beijing University of Posts and Telecommunications, Beijing, China

Sponsored by TC1 & TC6

Systems Simulation
TH-PM-2 | Room 221/220

Chairs: Sam Connor, IBM & Dr. Jun Fan, Missouri University of Science & Technology

3–3:30 p.m.
Analysis of the Shielding Performance of 2-D Periodic Screens Against Near Sources
R. Araneo, G. Lovat, S. Celozzi, University of Rome, Roma, Italy

3:30–4 p.m.
Vent Hole Size Analysis for High-Frequency Systems Chassis Design
E. N. Chikando, E. J. Bodette, S. R. Connor, B. Archambeault, IBM Corporation, Raleigh, U.S.A.

4–4:30 p.m.
Modeling the Near-Field Coupling of the EMC Filters Components
S. Zangui, Umr cnrs 5005, Ecully, France; K. Berger, Umr cnrs 5005, Ecully, France; C. Vollaire, Umr cnrs 5005, Ecully, France; E. Clavel, Umr cnrs 5269, St Martin d'HÃ¨res , France; R. Perrussel, Umr cnrs 5005, Ecully, France; B. Vincent, Umr cnrs 5005, Ecully, France

4:30-5 p.m.
Efficient Mid-Frequency Plane Inductance Computation
F. Zhou, A. Ruehli , J. Fan, Missouri University of Science and Technology, Rolla, U.S.A.

Sponsored by TC9

SPECIAL SESSION: Nanomaterials and Nanodevices for EMC Applications
TH-PM-3 | Room 209/210

Chairs: Prof. Sabrina Sarto, University of Rome, & Dr. Alessio Tamburrano, University of Rome

3–3:30 p.m.
The Partition Algorithm for Interconnect Analysis in Carbon Nanotube Based ASICs
X. Zhang, R. Luo, Tsinghua University, Beijing, China

3:30–4 p.m.
Experimental Characterization of Electrical Properties of Carbon Nanotube Networks Using Planar Transmission Lines
M. EL Sabbagh, Syracuse University, Syracuse, U.S.A.

4–4:30 p.m.
Skin-Effect Modeling of Carbon Nanotube Bundles: The High-Frequency Effective Impedance
M. D'Amore, M. Sarto, A. D'Aloia, Sapienza University of Rome, Rome, Italy

4:30-5 p.m.
Full-wave Evaluation of Carbon Nanotubes as Microwave Interconnects
K. Kim, University of Colorado, Boulder, U.S.A.; P. S. Rice, University of Colorado, Boulder, U.S.A.; P. Kabos, National Institute of Standards and Technology, Boulder, U.S.A.; D. S. Filipovic, University of Colorado, Boulder, U.S.A.

5-5:30 p.m.
Electromagnetic Absorbing Nanocomposites Including Carbon Fibers, Nanotubes and Graphene Nanoplatelets
M. Sarto, Sapienza University of Rome, Rome, Italy; G. De Bellis, Sapienza University of Rome, Rome, Italy; A. Dinescu, National Institute for Research and Development in Microtechnologies, Bucharest, Romania; A. Tamburrano, Sapienza University of Rome, Rome, Italy; I. M. De Rosa, Sapienza University of Rome, Rome, Italy

5:30-6 p.m.
Predicting of Wideband Electromagnetic Responses of Composites Containing Magnetic Inclusions
K. N. Rozanov, Institute for Theoretical and Applied Electromagnetics, Russian Academy of Sciences, Moscow, Russian Federation; M. Y. Koledintseva, Missouri University of Science and Technology, Rolla, U.S.A.; J. L. Drewniak, Missouri University of Science and Technology, Rolla, U.S.A.

Sponsored by TC11

AFTERNOON SESSIONS 3:30 PM-5 PM

Capturing the Electromagnetic Environment 2
TH-PM-4 | Room 207/208

Chairs: Dr. Randy Jost, University of Utah & David Hilton

3–3:30 p.m.
An Automated Measurement System for Cosite Interference Analysis
M. A. Young, M. C. Miller, F. German, Delcross Technologies, Champaign, U.S.A.

3:30–4 p.m.
Simulation and Data Management for Cosite Interference Prediction
F. German, K. Annamalai, M. Young, M. C. Miller, Delcross Technologies, Champaign, U.S.A.

4–4:30 p.m.
Off-Hull Radio Frequency Emissions from Below-Deck Spaces in Ships
G. B. Tait, Naval Surface Warfare Center Dahlgren, Dahlgren, U.S.A.; M. B. Slocum, Naval Surface Warfare Center Dahlgren, Dahlgren, U.S.A.; D. R. Hilton, Space and Naval Warfare Systems Center, San Diego, U.S.A.; C. A. Dilay, Space and Naval Warfare Systems Center, San Diego, U.S.A.; D. F. Southworth, Space and Naval Warfare Systems Center, San Diego, U.S.A.

4:30-5 p.m.
Simulation and Measurement of Electromagnetic Radiation Absorption in a Finished-Product Warehouse
J. Ferrer Coll, KTH Royal Institute of Technology, Kista, Sweden; P. Angskog, University of Gavle, Gavle, Sweden; C. Karlsson, University of Gavle, Gavle, Sweden; J. Chilo, University of Gavle, Gavle, Sweden; P. Stenumgaard, Swedish Defence Research Agency, Linkoping, Sweden

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BREAK TIME
Have a few minutes to spare between sessions? Visit the Exhibit Hall where you will find break areas, EMC hardware experiments and computer modeling and simulation demos, exhibitor product application demonstrations, and the new poster paper program.

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)

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

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.

Sponsored by TC1

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

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, Salzhausen, Germany
3. **EMC Chapter Development History at Japan and in Region 10**
   Takeo Yoshino, Professor Emeritus, University of Electro-Communications, Tokyo, Japan

Sponsored by TC1

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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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
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

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.

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
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

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   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 Hofman, 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.

Sponsored by TC1

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.

Sponsored by TC 2

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 IS017025 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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MONDAY THURSDAY

TECHNICAL COMMITTEES play an important role in the overall success of the EMC Society by promoting activities in their fields and providing expert knowledge and assistance to generate and review technical papers, organize and operate sessions at symposia, generate and develop standards and evaluate the "state of the art" in EMC science. All meetings are open to everyone. Join them for breakfast, a break, lunch or dinner. Listen to the discussions and learn what they are working on. Join your peers who volunteer to make EMC better and you, too, can be part of the solution and the future of EMC!

Technical Committee 1: EMC Management
This committee is concerned with the development and dissemination of Best Practices and Methodologies for the successful leadership, supervision and guidance of EMC related activities. These Best Practices and Methodologies shall be structured so as to provide assistance to all managers, and engineers. Appropriate and convenient tools shall serve as a foundation to these Best Practices and Methodologies.

Technical Committee 2: EMC Measurements
This committee is concerned with the measurement and instrumentation requirements in EMC standards and procedures and how they are interpreted. Also concerned with the adequacy of measurement procedures and measurement instrumentation specifications for radiated and conducted emission and susceptibility tests and the rationale for performance limits for these tests.

MEETINGS:

Monday, July 26
Technical Advisory Committee (TAC) Meeting #1, 7-9 a.m., Room 125
TC-6 Spectrum Management, noon-1 p.m., Room 122

Tuesday, July 27
Education and Student Activities Committee (ESAC), 7-9 a.m., Room 124
TC-1 EMC Management, 7-9 a.m., Room 125
TC-2 EMC Measurements, 8-9 a.m., Room 122
TC-3 Electromagnetic Environments, noon-1:30 p.m., Room 119
TC-7 Nonsinusoidal Fields, 7:30-8:30 am., Room 119
TC-9 Computational Electromagnetics, noon-1 p.m., Room 124

Wednesday, July 28
TC-4 Electromagnetic Interference Control, noon-2:30 p.m., Room 124
TC-5 High Power Electromagnetics, noon-1:30 p.m., Room 125
TC-10 Signal Integrity, noon-1 p.m., Room 123
TC-11 Nanotechnology, noon-1 p.m., Room 118

Thursday, July 29
Technical Advisory Committee (TAC) Meeting #2, 7-9 a.m., Room 124

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

Technical Committee 3: Electromagnetic Environment
This committee is concerned with electromagnetic environment (EME), development of standards for EME measurement and characterization, natural and man-made sources of EME that comprise this environment, effects of noise on systems performance, and effects of international civil and military standards intended to control man-made intentional and unintentional emissions of electromagnetic energy.

Technical Committee 4: EMI Control
This committee is concerned with design, analysis, and modeling techniques useful in suppressing interference or eliminating it at its source. Bonding, grounding, shielding, and filtering are within the jurisdiction of this committee. These activities span efforts at the system, subsystem, and unit levels.

Technical Committee 5: High Power Electromagnetics
This committee is concerned with the effects and protection methods for electronic equipment and systems for all types of high power electromagnetic environments. These environments include electromagnetic pulse (EMP), intentional EMI environments, lightning electromagnetic currents and fields, and electrostatic discharge.

Technical Committee 6: Spectrum Management
This committee is concerned with frequency coordination, management procedures for efficient spectrum use, band occupancy and congestion, federal regulations and their adequacy.

Technical Committee 7: Nonsinusoidal Fields
This committee is concerned with application of electromagnetic signals with large relative bandwidth, commonly referred to as nonsinusoidal waves, delineation of the differences between time-domain and frequency-domain principles, analytical and numerical treatments of the Maxwell postulates directly in time-domain, conceptualization, design, fabrication, and testing of materials and devices for ultra-wide bandwidth systems.

Technical Committee 9: Computational Electromagnetics
This committee is concerned with broad aspects of Applied Computational Electromagnetic techniques, which can be used to model electromagnetic interaction phenomena in circuits, devices, and systems. The primary focus is with the identification of the modeling methods that can be applied to interference (EMC) phenomena, their validation and delineating the practical limits of their applicability.

Technical Committee 10: Signal Integrity
This committee is concerned with the design, analysis, simulation, modeling and measurement techniques useful in maintaining the quality of electrical signals. These activities encompass all aspects of signal integrity from the integrated circuit level to the system level.

Technical Committee 11: Nanotechnology
This committee is concerned with design, analysis, simulation, modeling, and measurement techniques associated with the area of nano-scale technology. The TC-11 activity will also focus on the EMC aspects related to the interconnection problems between nanostructured systems and subnano or micro-size devices, and on advanced artificial materials.

Maybe We Should Have Called It The A+ Series.

Our New "A" Series uses less energy, delivers more power, is lighter, smaller, and delivers a better price performance ratio.

Our new, redesigned "A" Series amplifiers are so powerful and so efficient that we're able to make them 25% to 50% smaller while maintaining the same output power. They're now lighter, more portable, and able to fit easily in a control room and that translates to one great value for you. Yet they still deliver 500, 1000 and 2500 watts of power, and even more depending on the model you choose.

We're getting more expandable too. Our "A" Series amps now cover the 10 kHz to 250 MHz frequency range. So you can test to virtually any standards.

They feature the latest FET technology, and can be controlled remotely with IEEE, RS-232, USB and Ethernet interfaces. And with all these innovative features, our "A" Series amps use less energy, that's good for you and good for the environment. Our new "A" series also comes with enhanced cooling technology.

At 40 years old, AR is still exceeding the grade, in quality, value, technology, craftsmanship, and service after the sale. And that makes these new "A" Series amplifiers a no-brainer.

To learn more, visit www.ar-worldwide.com or call us at 215-723-8181.

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USA 215-723-8181. For an applications engineer, call 800-933-8181.

In Europe, call ar United Kingdom 441-908-282766 • ar France 33-1-47-91-75-30 • emv GmbH 89-614-1710 • ar Benelux 31-172-423-000

Booth 408

TUESDAY THURSDAY

Monday, July 26
5:30-7 p.m., Room 304: Reception for Global University students and professors

Tuesday, July 27
8:30 a.m.-5:30 p.m., Room 304
Wednesday, July 28
8:30 a.m.-5:30 p.m., Room 304
Thursday, July 29
7 a.m.-5:30 p.m., Room 304

Global EMC University was first offered at the 2007 IEEE EMC Symposium in Honolulu, Hawaii as a means of helping engineers who were new to EMC get up to speed on a variety of topics that are an important part of EMC engineering. The overwhelming response to this program caused the EMC Society to add it to the technical program for the 2008 symposium in Detroit and 2009 in Austin. Both years it again received high praise from those who were in attendance.

Global EMC University is 20 hours of instruction on basic EMC-related topics that is run in parallel with the traditional technical sessions at the symposium. Students are encouraged to participate in symposium workshops, exhibits and social activities when they are not in class. Classes are taught by an international panel of educators, who are selected for this program based on their reputation for excellence in areas of practical importance to EMC engineers and their demonstrated ability to communicate effectively with students who are new to the field.

The targeted audience is EMC engineers who have been in the EMC profession less than five years; however, past classes have included many individuals who were EMC veterans wanting to improve their understanding of basic concepts. The overall objective of this sequence of lectures is to provide a comprehensive introduction to the basic concepts and skills that are necessary to be successful in the EMC profession.

LEARNING OBJECTIVES/OUTCOMES

Capacitance and Inductance
Al Ruehli, IBM
Introduction to the concepts of capacitance and inductance as they relate to electromagnetic coupling and the high-frequency behavior of components.

Transmission Lines: Time-Domain and Signal Integrity
Jim Drewniak, Missouri University of Science and Technology
An introduction to the time-domain solution of the transmission line equations, SPICE solutions, effects of mismatch, signal distribution, power distribution and decoupling, and the effects of losses.

Transmission Lines: Frequency-Domain and Crosstalk
Marco Leone
An introduction to frequency-domain transmission line analysis including models for electrically short lines (inductive and capacitive coupling), shielded wires and twisted pairs, numerical methods for electrically long and/or lossy lines.

Conducted Emissions and Power Supply Filters
Mark Steffka, GM
A brief review of the conducted emission regulatory requirements, the LISN, common-mode and differential-mode currents, and analysis of typical power supply filters.

Overview of Numerical Methods
Chuck Bunting, Oklahoma State University
A brief overview of numerical methods for solving problems in electromagnetics including FDTD, BEM, FEM techniques and the software that employs them.

PCB Layout and System Configuration for EMC
Todd Hubing, Clemson University
Printed circuit board layout techniques that reduced radiated emissions and improve a product's immunity to external noise sources including electrostatic discharge, conducted transients and radiated electromagnetic interference.

EMC Applications of Composite and other Novel Materials
Sabrina Sarto, University of Rome 'La Sapienza'
The electromagnetic properties of composite and other novel materials. Their uses in EMC applications. Measurements of these properties.

Antennas and Radiation EMC Standards
Andy Marvin, University of York
An introduction to Hertzian and loop dipoles, the half-wave dipole and the quarter-wave monopole, antenna arrays, general properties of antennas, Friis transmission formulas, multipath propagation, standard test sites and measurement equipment.

Mode-Stirred Chambers
Frank Leferink, Thales & Twente University
Principles of operation of mode-stirred chambers. Measurements in mode-stirred chambers.

Electromagnetic Shielding
Chris Holloway NIST
Principles of shielding of planar materials and shielding of enclosures. Techniques for the measurement of shielding.

A certificate of completion *will be provided to students who have signed in and signed out each day, thereby confirming 100% attendance at all lectures. CEUs will be assigned to this course.*

Prerequisites: *Engineering or Technology Degree with Electrical Theory*

Who should attend: *Entry-level engineers, technicians and professionals who want to gain insight into EMC technology.*

Important*: Attendance is based to those who pre-register for the Global University (on site registration limited to openings due to cancelations). Full registration for the 2010 IEEE International Symposium on EMC is required. The additional registration fee for Global EMC University is $250 (before June 27) or $275 (after June 27).*

Poster Session #1

A Guide for Selecting and Designing Your Method to Measure NSA
E. Blankenship, independent researcher, D. Arnett, S. Chan, Hewlett Packard

A Study of the use of a Low Order Reverberation Chamber for Shielding Measurements
C. E. Brench, D. A. Smith, Southwest Research Institute

A New Common-Mode EMI Suppression Technique for GHz Differential Signals Crossing Slotted Reference Planes
H. Chuang, T. Wu, National Taiwan University (NTU)

Design and Evaluation of a Novel AC Line Filter "Pentaleads" Having Quasi-Distributed Constant Structure
K. Harada, Y. Takase, H. Ono, M. Takahashi, F. Tsuda, S. Yoshida, NEC TOKIN Co.

Near-Field Coupling Model Between Electronic Systems and a Transmission Line
C. Leseigneur, P. Fernandez Lopez, D. Baudry, A. Louis, Irseem / Esigelec; C. Arcambal, CEA Saclay

The Effect of a Horizontally Stratified Ground on Lightning Electromagnetic Fields
F. Delfino, R. Procopio, M. Rossi, University of Genoa; A. Shoory, F. Rachidi, Swiss Federal Institute of Technology

Estimating Radiated Emissions from Printed Circuit Boards and Cables inside EMC Chambers
G. McCormick, Z. A. Khan, V. Devabhaktuni, M. Alam, University of Toledo; A. Wood, Air Force Institute of Technology

Measurement of Differential Mode Propagation in Printed Circuit Board for Satellites Applications
P. Tarquini, F. De Paulis, D. Di Febo, G. Antonini, A. Orlandi, UAQ EMC Laboratory; V. Ricchiuti, COMPEL

Suppression of Power/Ground Noise Using Meshed-Planar Electromagnetic Bandgap (MP-EBG) Structure for Ultra-Wideband (UWB) System-in-Package (SiP)
M. Kim, C. Yoon, K. Koo, C. Hwang, H. Sung, J. Kim, KAIST

Return Path Discontinuities and Their Impact on the Signal/Power Integrity
A. Ciccomancini Scogna, CST of America; E. Bogatin, Bogatin Enterprises

Poster Session #2

Diagnosis of EMI to Laptop WWAN Device from TFT-LCD Driver Using Non-Contact Measurement-Based Transfer Function Technique
K. Chen, T. Horng, C. Ho, National Sun Yat-sen University; J. Wu, K. Peng, National Kaohsiung First University of Science

Continued on page 88

ANSI | Emission Measurements, Antenna Calibration and Time Domain (TD) Applications

This workshop is presented in three parts over a two day period: (1) review of the 2009 edition of ANSI C63.4 (now accepted by the FCC for use), (2) review of ANSI C63.5-2006 and proposed changes for the next edition and (3) application of TD for test site validation and antenna calibration. These workshops are designed to increase your understanding of these standards and the TD approach. For the C63.4 workshop, there will be an analysis of the test site validation, including using the CISPR SVSWR method or arranging absorber material on the ground plane for use above 1 GHz. The C63.5 portion of the second workshop will lead the user through the document, highlighting which technique should be used based on the type of antenna being calibrated and how it is changed from the 1988 and 1998 editions. This is essential to ensure that the right antenna factor is obtained, especially when validating semi-anechoic chambers. Proposed application of the same TD method to validating test sites will also be presented. As time permits, attendees will get a chance to apply what they learned by solving real world

In the C63.4 workshop, you will learn:
- RF emission measurement procedures
- National and international regulatory implications
- Test facility and instrumentation requirements
- Equipment test arrangements and configurations

In the C63.5 workshop, you will learn:
- General test conditions
- Appropriate measurement geometry
- Application of standard site method
- Rationale for geometry specific
- correction factors for biconicals
- Measurement uncertainty guidelines
- How to take actual measurements
- Changes proposed for 2009 edition

The Time Domain workshop will present:
- Application for site validation
- Application for antenna calibration

Support material
- A complete lecture notebook
- FCC handouts and references
-

Expert Instructors
Workshops feature leading industry experts and ANSI C63® members, including Don Heirman, workshop director, Don HEIRMAN Consultants; Mike Windler, UL; Zhong Chen, ETS-Lindgren; and Bob Hofmann, Hofmann EMC Engineering

Date and location
July 23-24, 2010
Near the Fort Lauderdale, FL, Convention Center
(Transportation will be provided to/from hotels and the workshop venue.)

Hotel
For hotel info see www.emc2010.org
Registrants are responsible for securing and paying for their own hotel reservations.

Fee Includes:
Complete lecture notebook, continental breakfast, lunch, breaks, and completion certificate. Fee does NOT include copies of the draft or published standards.

Agenda
ANSI C63.4
- July 23:
  Registration: 8:30 a.m.
  Class: 9 a.m. - 5 p.m.

ANSI C63.5/Time Domain
- July 24:
  Registration: 8:30 a.m.
  Class: 9 a.m. - 5 p.m.

iNARTE Workshop, Examinations and Events

Monday, July 26
The iNARTE Examinations Preparation Tutorial is a recommended workshop for all who register to take the iNARTE Certification Examinations on Friday, July 30, and will also be of value to those who plan to attend The Global EMC University and who will want to later validate their newfound credentials. This year we plan once again to offer two different Certification examinations, our traditional eight-hour examination for EMC Engineers or Technicians, and also a new four-hour examination leading to a Certification for Test Laboratory Auditors. At the workshop we will advise attendees as to the format of both examinations, discuss the best approach to ensure success and provide some working examples of typical exam questions. The last two hours will be devoted to a trial examination paper, where we will pose 20 typical questions. All attendees are invited to bring reference materials, calculators and laptop computers if planning to take this trial examination.

Friday, July 30
The iNARTE Certification Examinations will be held at the Fort Lauderdale Convention Center from 8 a.m.-5 p.m. We hope that many who attend The Global EMC University lectures during the week will validate their knowledge and experience by becoming an iNARTE Certified Engineer or Technician. This is an ideal time and place to take the open book examination element of our Certification process. The exams for EMC Engineer and EMC Technician will run concurrently. Each is a two-part paper, and each part is scheduled to run for four hours with an optional one-hour break at lunchtime. The Test Laboratory Auditor examination is a single four-hour paper and candidates can elect to attend either the morning or afternoon sessions. Examinees may bring any reference materials and a PC to the examination room.

Tuesday, July 27 through Thursday, July 29
iNARTE will be at a booth each day in the Exhibition Hall. All members and anyone interested in learning more about iNARTE and Certification programs are invited to come and visit. Register for any of the Friday Examinations at the booth, if you have not previously registered, and check out the books and CDs that may be used as study guides for the examinations.

For more information, contact Brian Lawrence, Executive Director, at Lawrence@inarte.us

WEDNESDAY 10:30 AM-3 PM

In these challenging times, change is inevitable. Fortunately, for engineers with EMC skills, there is high demand for skilled practitioners at all levels. Therefore, EMC Society is sponsoring a job Fair from 10:30 a.m.-3 p.m. on Wednesday, July 28. The Job Fair will be held in the Convention Center, including private interview spaces.

The job fair is being provided as a service to our members, future members and companies that support the EMC profession.

Bring many resume copies so that all the recruiters from around the world who come to the job Fair can have a copy. We plan to have representatives from companies in the Southern Florida area, as well as all over the U.S., Europe, and more. The focus of the Job Fair will be for positions relating to EMC consistent with the scope of the symposium.

There is no registration fee to go to the Job Fair; however, you do have to register. Please pre-register or register on site for the "Free Exhibit Hall Only Pass," which includes access to the job Fair, Society Working Group & Committee and Board Meetings, Industry Collateral Meetings, Hardware Experiments & Demonstrations, Computer Modeling & Simulations Demonstrations, Technical Committee Meetings and Exhibit Hall.

For more information please contact: *John Wyncott, Job Fair Coordinator, at john. Wyncott@ISEMC.org*

Tips for Participating at the Job Fair

- Dress professionally: Wear a suit, handle this as you would a regular interview.
- Wear comfortable shoes: You will be doing a lot of standing, talking and walking around.
- Resumes: Bring a supply of resumes to hand out to the companies.
- Bring a portfolio/briefcase to hold your resumes, job application information and to collect the corporate literature and business cards from companies.
- Prepare a "one minute self commercial:" Think about your strong points, your goals, and how you will benefit a company.
- Arrive early: Plan on time to talk to all the companies, and have time for an on-site interview.

Networking events offer attendees times and places to network with their peers in the industry and recognize those who have achieved excellence or contributed to the EMC profession.

WELCOME RECEPTION

5:30-9 p.m. Tuesday, July 27

Renew old acquaintances and meet new friends, while celebrating Latin America. The reception starts in the Exhibit Hall with a cocktail hour with exhibitors. Afterwards, move to the Grand Floridian Ballroom for the remainder of the reception. Be sure to have Reception tickets available while in the exhibit hall. Staff will circulate in the Exhibit Hall, exchanging tickets for a "Capia" pin, a traditional Latin item shared with family members as they gather for special events.

The ballroom will feature a taste of traditional Latin American dishes. Spread across the spacious ballroom will be several buffets with the sumptuous selections. Ample table seating will be available for those who would like to share their dining table with friends.

On the opposite side of the ballroom, pull up to one of the tables near the dance floor in the "Latin Nighclub" and take in the big band sound of one of Miami's hottest Latin bands. Enjoy

Latin American dancing by Latin Beat Dance Studio Inc. It should be a hot Florida Salsa

Dance Beat Night with something for everyone!

A Full Technical Registration (member, non-member, life members, retired, unemployed or student) or a Companion Club Registration includes one ticket to the Reception and two drink coupons. All others may purchase a ticket to the Reception (and two drink coupons) as an add-on cost to registration.

GALA EVENING EVENT

6:30-9:30 p.m. Wednesday, July 28

Toss off your formal shoes and dress wear, slip into comfortable beach clothes and experience a Floridian evening beach party. Transportation will operate all night between the convention center and a private beach on the Atlantic Ocean. Once there, music, food and a relaxed atmosphere under the Floridian sunset sky and ocean breezes will keep you mellow all evening.

Come relax and let the warm sands of the beach sift through your toes as you put the cares of the normal life behind you. It will be a Gala event like the IEEE International Symposium on EMC has never seen before.

A Full Technical Registration (member, non-member, life members, retired, unemployed or student) or a Companion Club Registration includes one ticket to the Gala and two drink coupons. All others may purchase a ticket to the Gala (and two drink coupons) as an add-on cost to your registration.

AWARDS LUNCHEON

1-2:30 p.m. Thursday, July 29

The Exhibit Hall will be closed starting at 1 p.m., and the technical program will be on break during the Awards Luncheon. The Awards Luncheon will be the last formal opportunity to gather and network with family of EMC professionals from academia, industry, government, military, and retired. The event will start off with a catered sit-down meal. Afterwards, the EMC Society will take time to recognize members and non-members for their contribution to the society and professional excellence.

For those with a Full Technical Registration (member, non-member; life members, retired, unemployed or student) or a Companion Registration includes one ticket to the Luncheon. All others may purchase a ticket to the Luncheon separately. This is not an event for children; however, children 8 and younger are free.

MORE NETWORKING EVENTS:

HOSPITALITY NIGHTS

6-9 p.m. Monday and Thursday

Like in the early years of the symposium, symposium exhibitors will host hospitality nights Monday and Thursday. Get on the shuttle buses, make plans to visit all the hospitality suites, meet up with others, network, share ideas and support the exhibitors.

CHAPTER CHAIR DINNER

5:30 - 7:30 p.m. Monday (Room 316)

The main objective of the dinner is the exchange of information between the chapter chairpersons and the EMCS global and regional officers. More active chapters could assist less active chapters by exchanging their experiences, knowledge and methods about developing a chapter and organizing events. Chapter officers are slated to give short presentations on the activities and best practices in their chapters.

FOUNDERS LUNCHEON

Noon-1:30 p.m. Wednesday (Room 316)

The Founders Luncheon is open to the founders of the EMC Society, members of the Board of Directors, and students.

COMPANION CLUB HOSTED TOURS

COMPANION CLUB

Adults or Junior companions can register for the Companion Club. Those who pre-register or plan to register on-site may go directly to the registration desk located in the Convention Center to obtain a special Companion Club registration packet (on-site registration limited to quantities on hand).

The Companion Club packet includes:

- A badge that will allow access to the Companion Club Suite
- A special gift pack
- One ticket for the Tuesday welcome reception, with two drink tickets for the welcome reception

Fully paid, registered EMC 2010 Companion Club members are welcome to enjoy an extended complimentary continental breakfast and snacks and drink throughout the week. The Companion Club Suite will be open from 7:30 a.m.-5:30 p.m. July 26-30.

Registered Junior Companions (age 8 to 18) are also welcome in the Companion Club Suite with an Adult Companion Club member. Children younger than 8 (with a free Exhibit Hall registration badge) are allowed in the Companion Club room, if accompanied by a registered adult Companion Club member.

Hosted Tours

The tour program begins with a variety of cultural, historical and fun trips planned by the Symposium Committee to enhance the Fort Lauderdale experience.

These special tours are hosted by a dedicated symposium escort.

BILLIE SWAMP SAFARI ECO-TOUR

Monday, July 26

$70 adults, $60 children (4-12)
Depart Convention Center: 8:30 a.m.
Return to Convention Center: 5 p.m.
www.swampsafari.net

For centuries, nature has persevered and fashioned one of the world's most intriguing environments: Big Cypress, the watershed of the Florida Everglades and home of the Seminoles Indian reservation. The Seminoles clearly understand the importance of their land and rich heritage by presenting a safari experience on the Reservation. See nature at its best. Wetlands, hardwood hammocks and sloughs where wildlife abounds, sightings of deer, water buffalo, bison, wild hogs, hawks, eagles other rare birds and alligators are common. There are even Florida panthers in the area. Enjoy dining in the full-service restaurant, the Swamp Water Cafe, and sample Seminole specialties, such as gator nuggets, frog legs, catfish and fry bread with honey, or make a selection from the regular menu.

The tour starts with a one-hour drive across Route 75 (Alligator Alley) into the center of the Everglades to 2,200-acre Big Cypress Reservation. The tour includes a one-hour swamp buggy tour, walking safaris, a 20-minute airboat ride, an educational reptile show, lunch, Indian cultural history and bus transportation. (Children younger than 3 cannot take the airboat ride.)

BUTTERFLIES AND FLEAS

Tuesday, July 27

$42 adults, $35 children (4-12)
Depart Convention Center: 9 a.m.
Return to Convention Center: 4:30 p.m.
www.butterflyworld.com; www.festival.com

In the morning, visit Butterfly World, one of the world's finest centers of education and environmentalism, helping to bring butterfly conservation and preservation to the nation and to the world. Careful planning and control have created the right conditions for thousands of butterflies to fly, court, feed and bask in the sunlight, as visitors walk among them. Because most of these butterflies are bred at Butterfly World, visitors will also be able to witness their entire life cycle. See the flight of Streamertail Hummingbirds from Jamaica and the Sun Birds of Africa, species that cannot be seen outside of their native countries. The Lorikeets will eat right out of visitors' hands and hummingbirds will buzz among the Gouldian Finches, Honeycreepers and Euphonias. In the English Rose Garden, more than 20 varieties bloom year-round, enchanting all with timeless beauty and fragrance.

Lunch and the remainder of the day will be spent at the Festival Flea Market Mall, America's largest Flea Market Mall. This is a shopper's paradise with more than 500 stalls, restaurants, fragrance outlets, cosmetic vendors, shoe

Photos courtesy of VISIT FLORIDA

stores, clothing shops, jewelry shops, gift boutiques and more. Tour participants will be given discount tickets when they are dropped off at one end of the mall, and will be on their own for lunch. The bus will pick participants up at the other end of the mall at 4 p.m. for the ride back to the Convention Center.

SHOP 'TIL YOU DROP

Wednesday, July 28
$22 adults and children
Depart Convention Center: 9:30 a.m.
Return to Convention Center: 4:30 p.m.
www.sawgrassmills.com

Shopaholics unite! Sawgrass Mills is a popular, alligator-shaped shopping mall. With 2,383,906 square feet of retail selling space, it is the sixth-largest mall in the United States, the second in Florida, the fourth-largest outlet mall in the world, and the 19th-largest mall in the world. This behemoth mall has more than 350 stores and outlet shops, including outlets such as Saks Off Fifth, Neiman Marcus' Last Call, Nordstrom's, JC Penney, Calvin, Ralph and much more - too many to name them all.

After a few hours of shopping, enjoy a gastronomical delight on your own at one the many restaurants: Cheesecake Factory, Max's, Legal Seafood, Rainforest Cafe. Then off for more shopping. For a list of stores and restaurants, visit www.sawgrassmills.com.

There are many activities especially designed for children. The big hit for the kids is Wannado City (www.wannadocity.com). Located in Sawgrass Mills, the indoor theme park allows children to role play in hundreds of careers in realistic venues for an additional entrance fee of $14 per child.

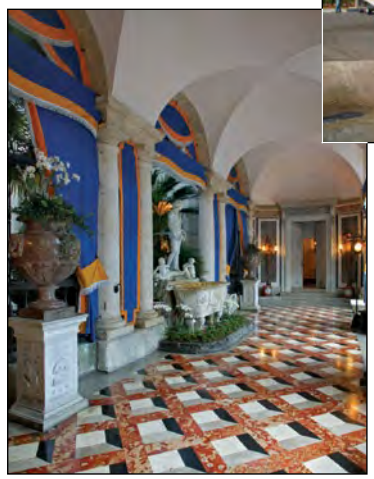
Gameworks (www.gameworks.com) at Sawgrass Oasis is a 20,000-square-foot interactive arena. The entertainment destination delivers the best all-around games, drinks, food, music. Players of all ages are the attraction.

Comfortable walking shoes are highly recommended. The group will receive a coupon book mall directory and shopping bag, compliments of Group Sales at Sawgrass.

JAPANESE GARDENS AND MUSEUMS

Thursday, July 29
$47 adults
Depart Convention Center: 9:30 a.m.
Return to Convention Center: 3:30 p.m.
www.moriakami.org

The Morikami Museum and Japanese Gardens is located in Delray Beach, which is about 30 miles from downtown Fort Lauderdale. The original building, named the Yamato-kan, is modeled to suggest a Japanese villa. It features a ring of exhibition rooms embracing an open-air courtyard with dry gardens. A permanent exhibit was built in 1993, chronicling the history of the Yamato Colony, a Japanese farming community in South Florida 100 years ago. The museum features exhibition galleries with a permanent collection of more that 5,000 Japanese art objects, including a 500-piece collection of tea ceremony items, more than 200 textile pieces and recent fine art acquisitions. In addition, there is an authentic tea house with viewing gallery, lakeside terrace and more. The 200 acres that surround The Morikami's two museum buildings include expansive, lush Japanese gardens with strolling paths, resting areas, tropical bonsai collection, small lakes teeming with koi and other wildlife. In 2001, the Morikami completed a major garden expansion and renovation. The new gardens reflect major periods of Japanese garden design, from the 8th to the 20th century, and serve as an outdoor extension of the museum. Don't miss the brightly colored Gouldian Finches, Honeycreepers and Euphonias that also call it home.



The Morikami Museum and Japanese Gardens are a half-hour bus ride from the Convention Center. A 60-minute guided audio tour will be provided in English and Spanish. A classical Japanese box lunch will be served. The tour ends with a return bus ride at 3 p.m.

VIZCAYA MUSEUM AND GARDENS

Friday, July 30
$42 adults
Depart Convention Center: 9:30 a.m.
Return to Convention Center: 3 p.m.
www.vizcayamuseum.org

Vizcaya is a National Historic Landmark and museum owned by Miami-Dade County and accredited by the American Association of Museums. This serene and stunningly beautiful retreat in the heart of Miami was built by agricultural industrialist James Deering in 1916. Vizcaya Museum & Gardens features a main house, 10 acres of formal gardens, a hardwood hammock, and soon-to-be-restored historic village.

At the time of Vizcaya's construction, Miami's population was around 10,000. More than 1,000 workers were employed in the Vizcaya project, including laborers and craftsmen from the Caribbean and Europe. In addition to the house and gardens, the complex included a farm, livestock, and a variety of other service facilities covering 180 acres on both sides of South Miami Avenue. When he began building his winter home, Deering engaged the assistance of Paul Chalfin, a young New York painter, to supervise the entire project. Deering and Chalfin traveled throughout Europe, surveying residential architecture for ideas and obtaining components such as doors, wall panels, mantels and ceilings that would be incorporated into the proposed home. Also working on the project were architect F. Burrall Hoffman and Colombian landscape architect Diego Suarez.

The tour will be conducted during the cool part of the day, starting with a short bus ride to the Vizcaya residence. A two-hour tour will be followed by lunch at The Rusty Pelican in Key Biscayne. The bus will return after lunch.

Concierge Tours

EMC Society organizers have arranged with the Convention Center concierge group rates and group tour dates

for some of the most popular public tours packages. Where possible, the tours have been coordinated to utilize hotel bus transportation. Each tour will have its own guide, but there will not be a dedicated symposium escort or host. It is possible to take these tours on dates and times other than the dates shown here; however, the group rates will not apply and participants will have to arrange their own transportation. Advance reservations are recommended. Only those registered for the Symposium may join the group tours. (Note: Exhibit-only registration is free.)

BAHAMAS ONE DAY TOUR

Sunday, July 25

$89.99 adults and children (including departure fees and tax)
$40 for those with birthdays in July (price covers Bahama departure fees and tax; the trip is free!)
Depart Port Everglades: 10 a.m. (Gates close at 8:45 a.m.)
Arrive Freeport, Grand Bahama: 2 p.m.
Depart Freeport, Grand Bahama: 6 p.m.
Arrive back at Port Everglades: 10:30 p.m.
www.discoverycruiseline.com

Enjoy the outdoors on one of the spacious cruise sun decks, take a dip in the pool, participate in the limbo contest, or simply move to the island music while cruising to the Bahamas. The Bahamas One Day Cruise offers two buffet meals, cruise bingo, a video arcade, cruise shows, a disco and other live cruise entertainment. Gaming enthusiasts will want to try their luck at the Las Vegas-rules casino with a slew of slots, table games, poker, roulette, blackjack and more. The Discovery Cruise will be ALL-INCLUSIVE, with alcoholic (house brands) and non-alcoholic drinks included onboard. The shows are for the enjoyment of the entire family. Caribbean music is played on the top deck, and a band in the international lounge plays a variety of music. Dance to rock, popular old melodies, Caribbean rhythm, and salsa. Disco music will be playing on the top deck.

At the Freeport/Lucaya at Grand Bahamas Island, activities range from shopping sprees to ecological adventures. Outside the city is an entire island filled with gorgeous beaches and natural wonders, including one of the world's largest underwater cave systems, three national parks, and an incredible resource of marine life. There are small towns that seem to sleep in time, and they hide a history unlike any other in the Caribbean.

The Discovery 1,200-passenger ship has daily (except Wednesdays) service to/from GBI.

A passport is required to book the trip. To make a reservation. call 800-259-1579.

Reservation code: ISEMC

The group rate can be applied to other dates during the symposium period.

FORT LAUDERDALE DUCK TOUR

Monday, July 26
$25 adults, $15 children
11 a.m.-12:30 p.m., 1-2:30 p.m. or 3-4:30 p.m.
www.fortlauderdaleducktours.com

The tour begins as participants board The "Duck" (DUKW), a custom-made state-of-the-art amphibious vehicle called a "Hydra Terra." Over the next 90 minutes, the Captain will lead a wacky journey through the neighborhoods of "The Venice of the Americas," famous Las Olas Boulevard and historical Fort Lauderdale.

Then the Captain will drive out of Fort Lauderdale and into the beautiful intercoastal waterways for a cruise. Catch a spectacular view of the mega yachts and how the rich and famous live and play in Port Everglades, the second biggest cruise and cargo ship port in the world. Experience Florida's flora and the fauna, and watch for the pelicans and iguanas basking in the sunshine, manatees. They promise lots of fun and laughs for the whole family.

ISLAND GETAWAY AND BEACH ADVENTURE

Tuesday, July 27
$50 adults, $20 children
11 a.m.-4:30 p.m.
www.tropicalsailing.com

An unforgettable excursion awaits those aboard the state-of-the-art catamaran. Trip departs from Bahia Mar Marina. Sit back and relax while sailing to a ocean and barrier island destination.

Cruise through Port Everglades, home to many cruise lines, "Venice of America," and "Millionaires Row." View beautiful mansions, mega yachts, historic sites and the exciting array of dining and shopping options in Fort Lauderdale.

Next stop is an exotic barrier island between the Atlantic Ocean and the Intracoastal Waterway, which offers a broad flat beach providing a perfect spot for beachcombing, swimming, sunbathing, kayaking and volleyball. This astounding beachfront preserves some of South Florida's vanishing natural resources. Its natural setting contrasts sharply with the fast growing urban development of Fort Lauderdale. Island beach facilities include full service bar/restaurant, clean restrooms, freshwater showers, snorkel equipment, kayaks and canoes, and chaise lounges.

This trip includes a delicious lunch at the Loggerhead Cafe on the island, domestic beer or large soda. Taxes and tip for food is also included. Child ticket (younger than 12) includes one item from child menu and a soda. Water sports, kayak, rentals, canoes are $10, snorkeling equipment $5 available at the island.

One trip that has it all. Great for families.

SOUTH BEACH, MIAMI

Wednesday, July 28
$40 adults, $25 children
10 a.m.-4 p.m.

Come visit Miami's South Beach that has been called "The American Riviera" and "Hollywood of the East." Some know it as "Sobe" or the "Art Deco District." This is excess to the max! Many come to South Beach simply to get a taste of the tons of world culture. The Latin-American population has inspired the area, and the diversity of the people is apparent in the various ethnic neighborhoods, food and music. In addition, South Beach is an international playground with non-stop nightlife in the beautiful Art Deco hotels and nightclubs and, of course, the wide, sandy shores.

The tour bus will depart the Convention Center at 10 a.m. with a short ride to South Beach. Your tour guide will provide you with a narrated riding tour around the South Beach area. The bus will stop in South Beach where you will be on your own to combine a full day of shopping, lunching, visiting and beaching. The South Beach Local public bus is the cheapest and most scenic way to travel around South Beach. The shuttles breeze around the Beach every 10-15 minutes, stopping at numerous bus stops. The shuttle is air-conditioned and the fare is only 25 cents for each trip. Gather at 3 p.m. at the pickup point for the tour bus ride back to the Convention Center.

LAS OLAS BOULEVARD PROGRESSIVE LUNCH AND SHOPPING

Wednesday, July 28
$70 adults
10:30 a.m. - 3:30 p.m.
www.lasolasboulevard.com

Meaning "the waves" in Spanish, Las Olas Boulevard is known as Greater Fort Lauderdale's "style mile," lined with independently owned fabulous boutiques, galleries, specialty stores, fashion houses, a restaurant row with acclaimed chefs, and lively lounges and cafes with sidewalk seating. And the ambience of the boulevard makes shopping even more of a pleasure.

The tour starts with a bus ride or water taxi to the east end of the boulevard. From there, walk westward toward the center of town, visiting galleries and shops.

Shops and boutiques will keep shoppers busy all afternoon, interspersed with dining at the cafes and lounges for entrees and dessert. The seating is comfortable, whether inside at one of the deep-cushioned booths, or outside, under the twinkle-lit, air-conditioned canopy. In shopppers' earth-friendly shopping bags, they will find discount coupons

and specials. The tour ends with the pick up where the tour started, then back to the Convention Center by bus or water taxis.

RIVERFRONT CRUISE

Thursday, July 29
$20 adults, $15 children (younger than 12)
11 a.m., www.anticipation.com/riverfront

Travelers can spice up their vacation with an exciting cruise down Fort Lauderdale's unforgettable waterways. This is the place to go for anyone who wants to discover things to do in Florida. Visit the Historic New River in Sunny Fort Lauderdale and see how the rich and famous live. This scenic adventure will be a memorable on-of-a-kind vacation experience for family and friends.

Cruise the calm waters of Fort Lauderdale's magnificent inland waterways in a new, state-of-the-art, air conditioned safe and comfortable luxury yacht. The modern, elegant yachts offer the utmost in comfort in the new and completely redesigned interior, panoramic views and air-conditioned salons. Enjoy light snacks and drinks from the bar while cruising along Florida's beautiful Gold Coast. Hear fascinating narration by the Coast Guard-licensed Captain describing the sights, the history and legends of the waterways. See breathtaking views along the New River, the Intracoastal Waterway and Port Everglades.

JUNGLE QUEEN DINNER CRUISE

Thursday, July 29
$39.45 adults, $21.45 children (younger than 12)
6 p.m., www.junglequeen.com

Come dressed very casually to the beautiful 550-passenger Jungle Queen River boat that will leave the Bahia Mar Docks for their famous Bar-B-Que and Shrimp Dinner Cruise to a tropical isle on the New River. While sailing up the river, a pleasant and humorous commentary is given by the captain about the many interesting sights and beautiful homes seen along the way. After about a 45-minute cruise, lights will welcome passengers to their destination, "Jungle Queen Exotic Island". As the boat docks, get a friendly "All Ashore" by the captain, and directions to the dining room where a delicious dinner of barbeque ribs, chicken, shrimp, home fried potatoes, coleslaw and trimmings has been prepared by the chef and staff. The waitresses serve diners again and again until they've had "All They Wish to Eat." Water and iced tea are served with the meal. All other beverages are extra.

Retire from the table to the highlight of the evening: an hilarious variety revue. Take a few minutes when not eating dinner or enjoying the show to check out the Indian exhibit and gift shop, rare trees, foliage and birds from all over the world. The show is followed by the return trip with everybody enjoying the moonlit ride back to some classy background tunes.

explore Fort Lauderdale

RESTAURANTS

3030 OCEAN
3030 Holiday Drive, Fort Lauderdale, FL
954-765-3030, www.3030ocean.com
Prices: $10-$16 appetizers; $27-$44 entrees

The Flavor: Modern American Seafood

The Dish: "The menu changes frequently and emphasizes organic ingredients. Starters such as watermelon and French feta salad complement the raw bar, and main course offerings might include grilled pompano on wild arugula salad with passion fruit vinaigrette or tempura tuna with sweet rice, pickled cucumber and sesame chili sauce." – 10Best

AMBRY RESTAURANT
3016 E. Commercial Blvd., Fort Lauderdale, FL
954-771-7342, www.ambryrestaurant.com
Prices: $3.50-$12.95 appetizers; $16.95-$39.95 entrees

The Flavor: German-American

The Dish: The kitchen consists of German and American Dishes like Sauerbraten, different varieties of veal schnitzels, Bavarian platters, grilled steaks, prime rib, chicken dishes and seafood.

BISTRO MEZZALUNA
741 SE 17th St., Fort Lauderdale, FL
954-522-6620, www.bistromezzaluna.com
Prices: $14-$17 appetizers; $19-$42 entrees

ATTRACTIONS

AH-TAH-THI-KI MUSEUM – SEMINOLE TRIBE OF FLORIDA
34725 West Boundary Road, Clewiston, FL
863-902-1113, www.ahtahthiki.com

ANNE KOLB NATURE CENTER
751 Sheridan St., Hollywood, FL
954-926-2480, www.broward.org/Parks/WestLakePark/Pages/AnneKolb-NatureCenter

FLAMINGO GARDENS AND WRAY BOTANICAL COLLECTION
3750 S. Flamingo Road, Fort Lauderdale, FL
954-473-2955, www.flamingogardens.org

The Flavor: Italian

The Dish: Executive Chef Brian Rutherford enjoys creating menus that combine the classic comfort foods with a tantalizing twist. While the menu leans towards Italian, selections are eclectic and emphasize seasonal and local ingredients.

BY WORD OF MOUTH

3200 NE 12th Ave., Oakland Park, FL
954-564-3663, www.bywordofmouthfoods.com
Prices: $8-$10 appetizers; $13-$16 entrees

The Flavor: New American

The Dish: "Unassuming but outstanding, this restaurant never advertises, hence its name … There's no menu. Patrons are shown the day's specials to make their choice. Count on a solid lineup of fish, fowl, beef, pasta, and vegetarian entrées." – Fodor's

CAFE MARTORANO

3343 E. Oakland Park Blvd., Fort Lauderdale, FL
954-561-2554, www.cafemartorano.com
Prices: $14-$23 appetizers; $25-$42 entrees

The Flavor: Italian

The Dish: "Dining here is like being at a big, fat, Italian wedding, where eating, drinking, and dancing are paramount. The menu changes daily, but regulars can request special off-the-menu items ... Also keep your eyes wide open for such celebrities as Liza Minnelli, James Gandolfini, and Steven Van Zandt, among others, who make it a point to stop here for a meal while in town." – Frommer's

CAFE SEVILLE

2768 E. Oakland Park Blvd., Fort Lauderdale, FL
954-565-1148, www.cafeseville.com
Prices: $9.95-$13.95 tapas; $20.95-$25.95 entrees

The Flavor: Tapas

The Dish: "A lot of restaurants have come and gone in the past 22 years, but Café Seville has survived – and thrived. The cozy Fort Lauderdale café was cooking up wonderful Spanish-influenced dishes like rabbit in rosemary sauce, seafood-laden paella and tasty tapas long before we had a sea of ethnic eateries from which to choose." – Miami Herald

CAFE VICO

1125 N. Federal Hwy, Fort Lauderdale, FL
954-565-9681, www.cafevicorestaurant.com

The Flavor: Italian

The Dish: "Cafe Vico is a small place where the owner is there to make sure you're taken care of. From the time you sit down until the moment you leave, you feel important … The menu has all of the Italian classics; nothing fancy and nothing missing. Portions are not enormous but you certainly won't leave hungry." – Inside Fort Lauderdale

CANYON

1818 E. Sunrise Blvd., Fort Lauderdale, FL
954-765-1950, www.canyonfl.com
Prices: $13-$20 appetizers; $26-$32 entrees

The Flavor: Southwestern

The Dish: "Start with the smoked salmon tostada, which blends smoked salmon in a habanero reduction. The habanero, one of nature's hottest peppers, only packs a small punch in the subtle sauce. Entrees include a surprising amount of seafood for a landlocked cuisine." – CitySearch

CASA D'ANGELO

1201 N. Federal Hwy., Fort Lauderdale, FL
954-564-1234, www.casa-d-angelo.com

The Flavor: Northern Italian

The Dish: "This is the restaurant I head to for wood-burning-oven specialties or the superlative wine list, nicely categorized by Italian regions, so comprehensive it even has an index." – South Flordia Sun-Sentinel

FLORIDA EVERGLADES HOLIDAY PARK

21940 Griffin Road, Fort Lauderdale, FL
954-434-8111, www.evergladesholidaypark.com

FORT LAUDERDALE HISTORICAL SOCIETY FRANK LLOYD WRIGHT EXHIBIT

New River Inn, 231 SW 2nd Ave., Fort Lauderdale, FL
954-463-4431, ext. 16, www.fortlauderdalehistorycenter.org
http://www.fortlauderdalehistorycenter.org/center_exhibitions.html

HISTORIC STRANAHAN HOUSE MUSEUM

335 SE 6th Ave., Fort Lauderdale, FL
954-524-4736, http://stranahanhouse.org/
Tours: 1, 2 and 3 p.m. daily

MUSEUM OF ART FORT LAUDERDALE

One E. Las Olas Boulevard at Andrews Avenue, Fort Lauderdale, FL
954-525-5500, http://moaflnsu.org

MUSEUM OF DISCOVERY & SCIENCE

401 SW Second St., Fort Lauderdale, FL
954-467-6637, www.mods.org/home.htm

PARKER PLAYHOUSE

707 NE 8th St., Fort Lauderdale, FL
954-462-0222, www.parkerplayhouse.com

DA CAMPO OSTERIA
3333 NE 32nd Ave., Fort Lauderdale, FL
954-226-5002, www.dacampoosteria.com

The Flavor: Regional Italian

The Dish: The specialty of the house is [Chef Todd] English's signature mozzarella menu; diners may choose from a variety of delectable seasonal toppings and watch as their fresh mozzarella gets prepared to order tableside.

GALANGA
2389 Wilton Drive, Wilton Manors, FL
954-202-0000, www.galangarestaurant.com

The Flavor: Sushi, Thai

The Dish: "This popular, casually stylish restaurant delivers outstanding Thai and Japanese cuisine. Indeed, the skilled kitchen staff serves up everything from pad Thai to curry dishes to sushi and sashimi, and the refreshingly diverse menu ensures that you won't get bored." – 10Best

GREEK ISLANDS TAVERNA
3300 North Ocean Blvd.,
Fort Lauderdale, FL
954-565-5505, www.greekislandstaverna.com

The Flavor: Greek

The Dish: "The food is prepared with a just-right lilt, be it the savory souvlaki or one of the many lamb dishes the Greek seem to have mastered." – SunSentinel.com

GRILLE 66 & BAR
2301 SE 17th St.,
Fort Lauderdale, FL
954-728-3500, www.grille66andbar.com

The Flavor: Seafood, Steakhouse

The Dish: "This stunning spot is surrounded by multimillion dollar yachts. Foodies will be floored, and wine aficionados will be impressed by the list of 600 selections." – Miami Herald

HI-LIFE CAFÉ
3000 N. Federal Hwy.,
Fort Lauderdale, FL
954-563-1395, www.hilifecafe.com

The Flavor: New American

The Dish: "Patience is not only a virtue here, but a necessity. The food is absolutely wondrous, southern, French, a little Cajun maybe, as fruits and nuts add sweetness all over the fresh and meticulous meals that are served here daily." – SunSentinel.com

JOHNNY V
625 E. Las Olas Blvd.,
Fort Lauderdale, FL
954-761-7920, www.johnnyvlasolas.com

The Flavor: Floribbean

The Dish: Chef/Co-owner Johnny Vinczencz, "the man who married barbeque and boniato has created a

menu featuring some of his greatest hits, such as his wild mushroom 'short stack' and big shrimp 'martini' as well as an array of new delights, including his Florida king and stone crab 'shepherd's pie,' and barbeque glazed salmon with an aged cheddar gratin …"

LEMONGRASS ASIAN BISTRO

3811 North Federal Hwy., Fort Lauderdale, FL
954-564-4422, www.lemongrassasianbistro.com/lemongrass

The Flavor: Sushi and Sake

The Dish: "The menu verges on gigantic, but it's easy to navigate, and your bill will be just as easy on your wallet. And unlike other multipage menus, this one hangs together beautifully and never loses focus, effortlessly drawing out Vietnamese, Chinese, Hawaiian, Thai, and Japanese threads." – NewTimes Broward-Palm Beach

MARACAS MEXICAN BAR & GRILL

3001 North Federal Hwy., Fort Lauderdale, FL
954-537-2002, www.maracasusa.com

The Flavor: Mexican

The Dish: "When dining at Maracas Bar & Grill of Oakland Park it may be easy to get distracted by the 1,000 chili light and hundred or so maracas, but your grumbling stomach may keep you focused on Mexican dishes. Order anything from the tableside guacamole bowl, flame grilled taquitos, pollo relleno, chicken breast stuffed with Oaxaca cheese and more." – SunSentinel.com

RAINBOW PALACE

2787 E. Oakland Park Blvd., Fort Lauderdale, FL
954-565-5652, www.rainbowpalace.com

The Flavor: Chinese

The Dish: "If you're looking for traditional Chinese takeout-style food, this is not the spot for you. Rainbow Palace takes Chinese cuisine seriously, and adds a level of sophistication not often associated with that type of food." – SunSentinel.com

STEAK 954

401 N. Fort Lauderdale Beach Blvd., Fort Lauderdale, FL
954-414-8333, www.steak954.com

The Flavor: Steak, American, Modern

The Dish: "Steak 954 in Fort Lauderdale is hailed as a Stephen Starr, boutique-style steakhouse. The W Hotel restaurant is styled with dark woods and bright floral prints. There's also a 15–feet long reef aquarium, which houses jellyfish." – SunSentinel.com

SUKHOTHAI RESTAURANT

1930 E Sunrise Blvd., Fort Lauderdale, FL
954-764-0148, www.sukhothaiflorida.com

The Flavor: Thai

The Dish: "Before every block had a Thai restaurant, Sukhothai helped introduce the cuisine here. With reliable

quality, a handsome dining room and moderate prices, its customers have remained loyal and its popularity continues." – SunSentinel.com

SUNFISH GRILL

2761 E. Oakland Park Blvd., Fort Lauderdale, FL
954-561-2004, www.sunfishgrill.com

The Flavor: American (New), Seafood

The Dish: "Chef Tony Sindaco first made Sunfish synonymous with artfully prepared seafood at a tiny cafe in Pompano Beach before expanding to the current location in Fort Lauderdale. The biggest change from the move south is that Sindaco can now feed roughly three times as many people his original creations in a single seating. Fresh cuts of snapper, grouper and tuna are reinvented on a regular basis with ingredients you might not associate with seafood. The wine list, service and desserts are all first-rate." – SunSentinel.com

TEAL BISTRO

1103 E. Las Olas Blvd., Fort Lauderdale, FL
954-712-8933, www.tealbistro.com/home.htm

The Flavor: American Contemporary

The Dish: "Fresh, contemporary American cuisine, Teal BistroAmericana aims to capture the best of seasonal flavors with a modern eclectic flair. Try one of our signature cocktails at the waterfall bar or a glass of wine at the restaurant's outdoor patio. Teal service is paired with a relaxed, hip location on Las Olas Boulevard." – SunSentinel.com

THAI SPICE

1514 E. Commercial Blvd., Fort Lauderdale, FL
954-771-4535, www.thaispicefla.com

The Flavor: Thai

The Dish: "Thai Spice is one of Fort Lauderdale's best spots for an upscale Thai dining experience. Start by choosing a bottle off the extensive wine list, then pair your choice with something off the huge menu that's heavy on seafood and other Thai staples. While you're there, be sure to take in the decor, which creates a splendid atmosphere in which to enjoy your meal." – SunSentinel.com

THE E SPOT RESTAURANT AND BAR (INSIDE EMBASSY SUITES)

1100 SE 17th St., Fort Lauderdale, FL
954-527-2730, http://embassysuites1.hilton.com/en_US/es/hotel/FLLSOES/index.do

The Flavor: American, Bar

The Dish: "The E Spot Restaurant & Bar in the Fort Lauderdale Embassy Suites Hotel is not your typical hotel

restaurant and bar. The completely renovated restaurant and bar offers casual tasteful dining in a chic, fun atmosphere. Dinner is an adventure you need to experience." – Urbanspoon.com

TOM JENKINS' BAR-B-Q

1236 S. Federal Hwy. (Davie Blvd.) Fort Lauderdale, FL
954-522-5046, www.tomjenkinsbbq.com

The Flavor: Barbecue

The Dish: "It's Southern comfort food at great prices. Spare ribs, baby back ribs and chicken are grilled over wood and doused with a molasses and honey sauce developed from family recipes of the two owners. Side dishes, such as macaroni and cheese and collard greens, are homemade and definitely not low fat. Save a little room for the sweet potato pie." – CitySearch.com

TUSCAN GRILLE

1105 E. Las Olas Blvd., Fort Lauderdale, FL
954-766-8700

The Flavor: Italian

The Dish: "The setting is a waterfront patio trimmed in bougainvillea and the food is out of this world, prepared by one of South Florida's best culinary artists, Rino Balzano. His grand sense of style conjures entrees like salt-baked sea bass, lamb chops in rosemary and baked Bosc pear in chianti." – SunSentinel.com

YOLO

333 E. Las Olas Blvd., Fort Lauderdale, FL
954-523-1000, www.yoloresta.com

The Flavor: International

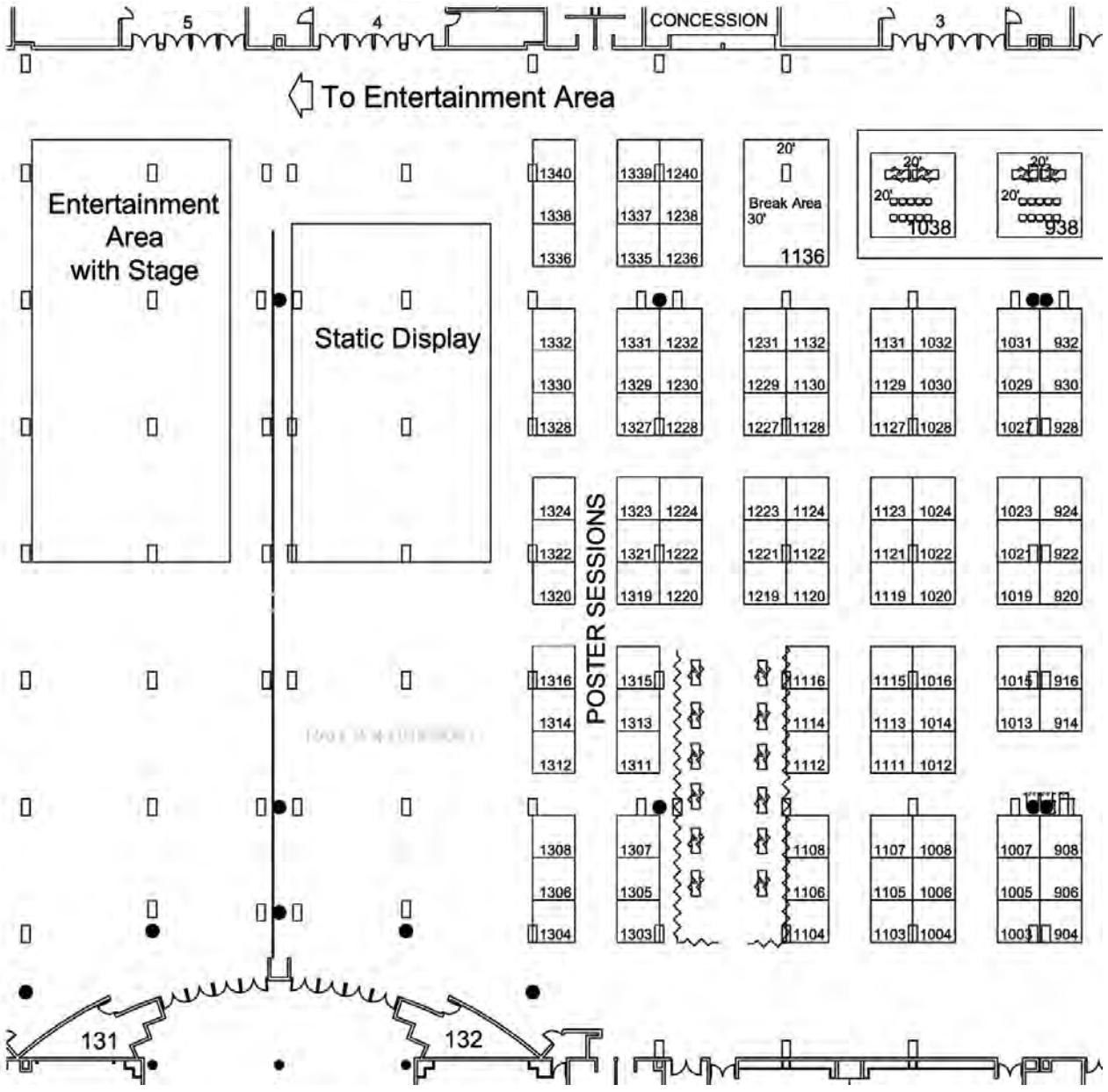
The Dish: "YOLO, which stands for You Only Live Once, is among the spots where people not only dine, but drink, too. The International menu includes dishes like the meatball sliders, pepper-herb seared tuna and a California spinach salad." – SunSentinel.com

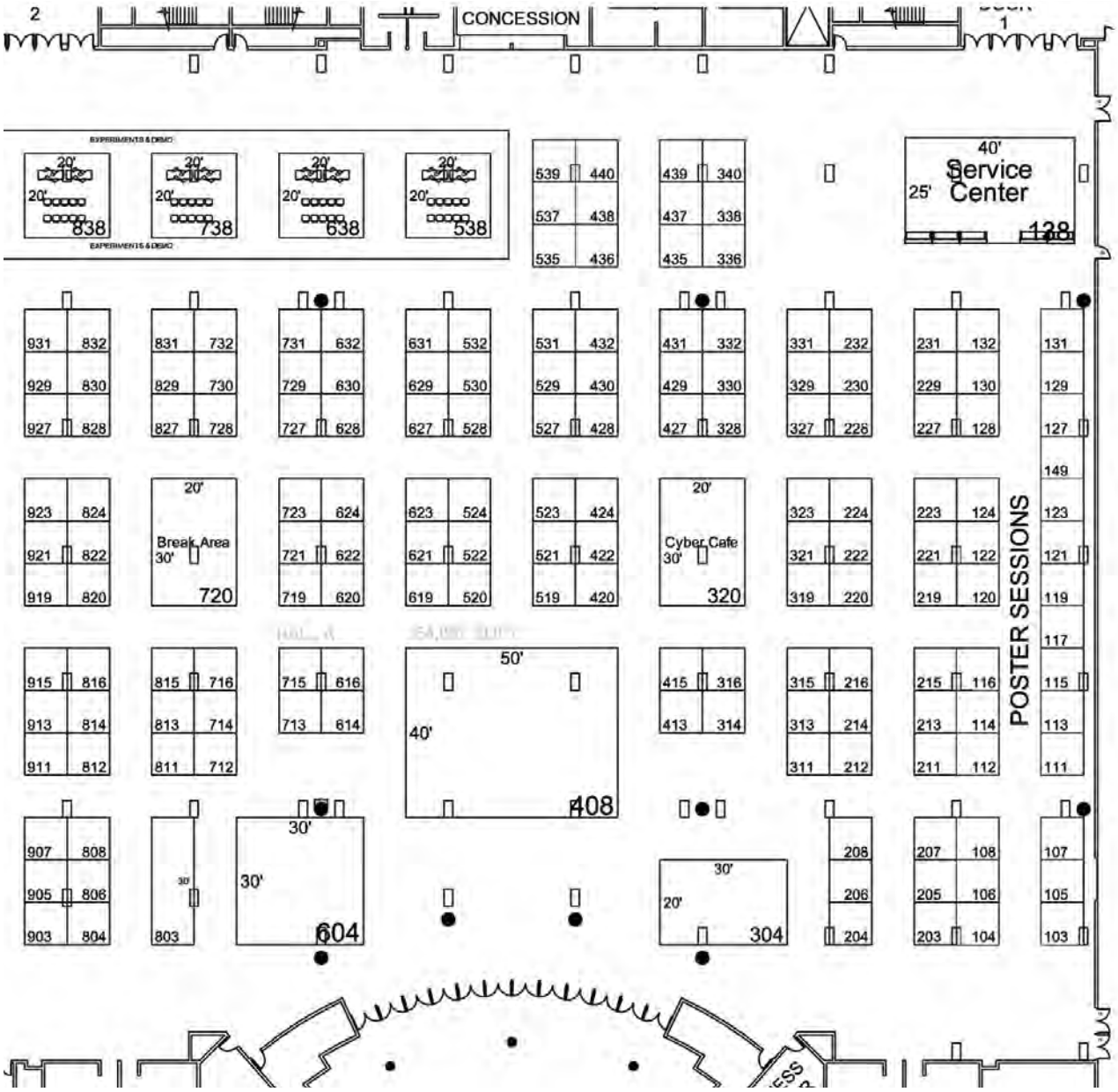
ZONA FRESCA RESTAURANT

1635 N Federal Hwy, Fort Lauderdale, FL
954-566-1777, www.zonafresca.com

The Flavor: Mexican

The Dish: "Zona Fresca is not exactly fast food, but it's not exactly a traditional sit-down restaurant, either. You walk in, order at the counter, then grab a table until your number is called. While you're waiting, grab some chips and wander over to the salsa bar, where a variety of freshly made salsas are available. At Zona Fresca, you can feel comfortable with whatever you order since it's all made from scratch daily using all-natural ingredients." – SunSentinel.com





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White Sands Missile Range SVAD 631
Wurth Electronics Midcom 1015

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2comu ..... **Booth 214**
Computer and Communication Unlimited Headquarters, 106 Fairfield Drive, State College, PA 16801; 814-466-6829; Fax: 814-466-7121; wenyu@2comu.com; www.2comu.com/

3M ..... **Booth 620**
Corporate Headquarters, 3M Center, St. Paul, MN 55144-1000; 888-364-3577; www.3m.com

A

A2LA - American Association for Laboratory Accreditation ..... **Page 42, Booth 327**
5301 Buckeystown Pike, Suite 350, Frederick, MD 21704; 301-644-3248; Fax: 301-662-2974; info@A2LA.org; www.A2LA.org

Advanced Test Equipment Rentals ..... **Booth 808**
10401 Roselle St., San Diego, CA 92121; 888-404-2832; Fax: 858-558-6570; sales@atecorp.com; www.atecorp.com

Aeroflex ..... **Booth 224**
Wichita Division, 10200 West York St., Wichita, KS 67215-8935; 316-522-4981; 800-835-2352; Fax: 316-524-2623; www.aeroflex.com

Agilent Technologies, Inc. ..... **Booth 1128**
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http://www.AHSystems.com

Page 17 ..... **Booths 520**

Alion Science and Technology ..... **Booth 328**
Headquarters, 1750 Tysons Blvd., Suite 1300, McLean, VA 22102; 703-918-4480; contact@alionscience.com; www.alionscience.com/

Amber Precision Instruments Inc. ..... **Booth 1014**
746 San Aleso Ave., Sunnyvale, CA 94085; 408-752-0199, ext. 101; FAX: 408-752-0335; amberpi@amberpi.com; www.amberpi.com

American TCB / Espresso Engineering ..... **Booth 228**
6731 Whittier Avenue, Suite C110, McLean, VA 22101; 703-847-4700; Fax: 703-847-6888; sales@atcb.com; www.atcb.com, www.espressoengineering.tv/

Americor Electronics, Ltd ..... **Page 57**
675 S. Lively Blvd. Elk Grove Village IL. 60007; 847-956-6200; Fax: 847-956-0300; info@americor-usa.com; www.americor-usa.com

ANDRO Computational Solutions, LLC ..... **Booth 914**
Beeches Technical Campus Bldg., Suite 4, 7902 Turin Road, Route 26N, Rome, NY 13440-2067; 315-334-1163; http://andro-computational-solutions.sbcontract.com/profile.htm

ANSI-ASC C63 Committee on EMC ..... **Booth 211**
Chairman Don Heirman, d.heirman@ieee.org; www.c63.org/index.htm

ANSYS, Inc. (Ansoft Products) ..... **Booth 329**
Southpointe, 275 Technology Drive, Canonsburg, PA 15317; 724-746-3304; Fax: 724-514-9494; ansysinfo@ansys.com; www.ansys.com

Apache Design Solutions ..... **Booth 922**
2645 Zanker Road, San Jose, CA 95134; 408-457-2000; Fax: 408-428-9569; apache_sales@apache-da.com; www.apache-da.com

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AR Receiver Systems provides a line of products and services for EMC testing including an EMI receiver, leak detectors and impulse generators. AR Receiver System products can be used for a wide variety of EMC testing needs and their products can be purchased through AR RF/Microwave Instrumentation.

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D.L.S. Electronic Systems, Inc.
ENR / Seven Mountains Scientific
In Compliance Magazine
iNARTE, Inc.
ITEM Publications / Interference Technology
Microwave Journal

BROADBAND EMI DETECTORS
Advanced Test Equipment Rentals
Agilent Technologies, Inc.
Dynamic Sciences International, Inc.
ETS-Lindgren

CABLES & CONNECTORS
Filconn s/w Applied EM Technology
Interpower Corporation
Swift Textile Metalizing LLC

CALIBRATION SERVICES
Advanced Test Equipment Rentals
Dayton T. Brown, Inc.
Dynamic Sciences International, Inc.
Fischer Custom Communications, Inc.
IFI - Instruments for Industry
National Technical Systems
NIST/NVLAP
Pearson Electronics, Inc.
Techmaster Electronics, Inc.
TESEQ, Inc.
Thermo Fisher Scientific
TÜV SÜD America Inc.

CERTIFICATION SERVICES
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D.L.S. Electronic Systems, Inc.
Elite Electronic Engineering Inc.
iNARTE, Inc.
National Technical Systems
Nemko USA
NIST/NVLAP
Panashield, Inc.
TDK-Lambda Americas Corporation
Timco Engineering, Inc.
TUV Rheinland of North America, Inc.
TÜV SÜD America Inc.
Underwriters Laboratories

COAXIAL FILTER CONNECTORS
Spectrum Advanced Specialty Products

COMPETENT / CERTIFIED ACCREDITING BODIES TESTING
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Elite Electronic Engineering Inc.
Intertek
Nemko USA
NIST/NVLAP
Northwest EMC, Inc.

COMPUTER-AIDED ANALYSIS SERVICES
Apache Design Solutions
CST of America, Inc.
ETS-Lindgren
National Technical Systems
NEC Corporation
TÜV SÜD America Inc.

CONDUCTIVE CLOTH
Laird Technologies
Leader Tech, Inc.
V Technical Textiles, Inc./Shieldex U.S.
Vanguard Products Corp.
ARC Technologies, Inc.

CONDUCTIVE MATERIALS
3M Electrical Markets Division
A-Jin Electron
ARC Technologies, Inc.
Doo Sung Industrial Co., LTD
EMI-tec Elektronische Materialien GmbH
Intermark (USA) Inc.
Oak-Mitsui Technologies
Swift Textile Metalizing LLC

CONDUCTIVE TAPES
Laird Technologies
Leader Tech, Inc.

CONSULTANTS
D.L.S. Electronic Systems, Inc.
Elite Electronic Engineering Inc.

EM Software & Systems (USA), Inc.
ETS-Lindgren
Ingenium Testing, LLC
ITEM Publications / Interference Technology
Laird Technologies
Leader Tech, Inc.
Nemko USA
Qualtest Inc.
TÜV SÜD America Inc.
White Sands Missile Range - SVAD

COUPLING-DECOUPLING NETWORKS

Haefely EMC
Liberty Labs, Inc

CURRENT PROBES

A.H. Systems, Inc.
Advanced Test Equipment Rentals
Fischer Custom Communications, Inc.
Liberty Labs, Inc.
Pearson Electronics, Inc.
Rohde & Schwarz, Inc.
TESEQ, Inc.

DESIGN SOFTWARE

AR RF / Microwave Instrumentation
CST of America, Inc.
EM Software & Systems (USA), Inc.
Moss Bay EDA/IBM
TDK Corporation

DIE CUT SHIELDING MATERIAL

Laird Technologies
Leader Tech, Inc.
Nolato Silikonteknik
Spira Manufacturing Corp.
Tech-Etch, Inc.
Vanguard Products Corp.

DIRECT LIGHTNING TESTING

Alion Science and Technology
Dayton T. Brown, Inc.
National Technical Systems
TÜV SÜD America Inc.

E-FIELD ANTENNAS

A.H. Systems, Inc.
Advanced Test Equipment Rentals
AR RF / Microwave Instrumentation
Dynamic Sciences International, Inc.
Instruments for Industry (IFI)
Noise Laboratory Co., Ltd.
Rohde & Schwarz, Inc.
TDK Corporation

EMI GASKETS

Av-DEC
EMI-tec Elektronische Materialien GmbH
Laird Technologies
Leader Tech, Inc.
Nolato Silikonteknik
Spectrum Advanced Specialty Products
Spira Manufacturing Corp.
Tech-Etch, Inc.
V Technical Textiles, Inc./Shieldex U.S.
Vanguard Products Corp.

EMI RECEIVERS

Advanced Test Equipment Rentals
Agilent Technologies, Inc.
AR RF / Microwave Instrumentation
Dynamic Sciences International, Inc.
ETS-Lindgren
Rohde & Schwarz, Inc.
TESEQ, Inc.

EMI TEST ANTENNAS

A.H. Systems, Inc.
Advanced Test Equipment Rentals
AR RF / Microwave Instrumentation
Dynamic Sciences International, Inc.
ETS-Lindgren
Instruments for Industry (IFI)
Rohde & Schwarz, Inc.
TDK Corporation
TMD Technologies Ltd

EMISSIONS TESTING

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Dayton T. Brown, Inc.
Dynamic Sciences International, Inc.
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Ingenium Testing, LLC
Intertek
Jacobs Technology
National Technical Systems
Nemko USA
Qualtest Inc.
Timco Engineering, Inc.
TUV Rheinland of North America, Inc.
TÜV SÜD America Inc.
Underwriters Laboratories
White Sands Missile Range - SVAD

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Dayton T. Brown, Inc.
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Ingenium Testing, LLC
Intertek
National Technical Systems
Northwest EMC, Inc.
TESEQ, Inc.
Thermo Fisher Scientific
TÜV SÜD America Inc.
White Sands Missile Range - SVAD

EMP GENERATORS

EM TEST USA
Fischer Custom Communications, Inc.
HV Technologies, Inc
Noise Laboratory Co., Ltd

EMP SIMULATORS

Advanced Test Equipment Rentals
EM TEST USA
Fischer Custom Communications, Inc.
HV Technologies, Inc.

ENVIRONMENTAL TESTING

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Elite Electronic Engineering Inc.
Timco Engineering, Inc.
TÜV SÜD America Inc.

ESD GENERATORS

Advanced Test Equipment Rentals
EM TEST USA
Haefely EMC
Noise Laboratory Co., Ltd.
Thermo Fisher Scientific

ESD SIMULATORS

Advanced Test Equipment Rentals
EM TEST USA
Fischer Custom Communications, Inc.
Haefely EMC
HV Technologies, Inc.
Liberty Labs, Inc.
Noise Laboratory Co., Ltd.
TESEQ, Inc.
Thermo Fisher Scientific

ESD TESTING

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Elite Electronic Engineering Inc.
Ingenium Testing, LLC
Intertek
Jacobs Technology
Nemko USA
Northwest EMC, Inc.
Thermo Fisher Scientific
Timco Engineering, Inc.
TÜV SÜD America Inc.
Underwriters Laboratories
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Dynamic Sciences International, Inc.
Elite Electronic Engineering Inc.
Ingenium Testing, LLC
Intertek
Jacobs Technology
National Technical Systems
Nemko USA
Panashield, Inc.
Timco Engineering, Inc.
TUV Rheinland of North America, Inc.
TÜV SÜD America Inc.
Underwriters Laboratories

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Universal Shielding Corp.
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FCC PARTS 15 & 18 TESTING

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Dayton T. Brown, Inc.
Dynamic Sciences International, Inc.
Elite Electronic Engineering Inc.
Ingenium Testing, LLC
Intertek
National Technical Systems

Nemko USA
Northwest EMC, Inc.
Panashield, Inc.
Thermo Fisher Scientific
Timco Engineering, Inc.
TUV Rheinland of North America, Inc.
TÜV SÜD America Inc.
Underwriters Laboratories

FCC PART 68 TESTING

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Elite Electronic Engineering Inc.
EM TEST USA
Haefely EMC
HV Technologies, Inc.
iNARTE, Inc.
Intertek
National Technical Systems
Nemko USA
Noise Laboratory Co., Ltd.
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Timco Engineering, Inc.
TUV Rheinland of North America, Inc.
Underwriters Laboratories

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Genisco Filter Corp.
Spectrum Advanced Specialty Products
Syfer Technology
TDK Corporation
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Intermark (USA) Inc.
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Spectrum Advanced Specialty Products
TDK-Lambda Americas Corporation

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Advanced Test Equipment Rentals
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Laird Technologies
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ETS-Lindgren
Instruments for Industry (IFI)

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TDK Corporation

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Syfer Technology
TDK Corporation
WEMS Electronics

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Laird Technologies
Schurter, Inc.
TDK Corporation
WEMS Electronics

FILTER COILS

Captor Corporation
Curtis Industries, Inc.
Laird Technologies
Schurter, Inc.
TDK Corporation
WEMS Electronics

FILTER CONNECTORS

Spectrum Advanced Specialty Products
Wurth Electronics Midcom

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Spectrum Advanced Specialty Products

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Syfer Technology

FILTER WIRE/CABLE

Laird Technologies

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Spectrum Advanced Specialty Products
Tri-Mag, Inc.
V Technical Textiles, Inc./Shieldex U.S.

FILTERS

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EMI Filter Company
EMPKO Co., LTD.
Genisco Filter Corp.
Heilind Electronics
WEMS Electronics

GROUNDING SERVICES

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Nemko USA

GTEM CELLS

Fischer Custom Communications, Inc.
Instruments for Industry (IFI)
Noise Laboratory Co., Ltd.
Rohde & Schwarz, Inc

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Dynamic Sciences International, Inc.
Instruments for Industry (IFI)
Noise Laboratory Co., Ltd.
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TDK Corporation
TESEQ, Inc.

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Intertek
Jacobs Technology
National Technical Systems
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ETS-Lindgren

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Liberty Labs, Inc

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Haefely EMC
HV Technologies, Inc.
Noise Laboratory Co., Ltd.
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Haefely EMC
HV Technologies, Inc.
Noise Laboratory Co., Ltd.
Thermo Fisher Scientific

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Fischer Custom Communications, Inc
Rohde & Schwarz, Inc.

MAGNETIC SHIELDING GASKETS
Spectrum Advanced Specialty Products
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Vanguard Products Corp.

MICROWAVE ABSORBERS
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Panashield, Inc.
TDK Corporation

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Syfer Technology
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Ophir RF
TMD Technologies Ltd

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National Technical Systems

MIL-STD 461/462 TESTING
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Jacobs Technology
National Technical Systems
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Panashield, Inc.
Qualtest Inc.
Thermo Fisher Scientific
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Underwriters Laboratories
White Sands Missile Range - SVAD

MOBILE SHIELDED ROOMS
Advanced Test Equipment Rentals
Panashield, Inc.

MONOPOLE ANTENNAS
Dynamic Sciences International, Inc.
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Liberty Labs, Inc
Noise Laboratory Co., Ltd.
Rohde & Schwarz, Inc.
TDK Corporation

MRI SHIELDING
ETS-Lindgren
Leader Tech, Inc.
Panashield, Inc.
V Technical Textiles, Inc./Shieldex U.S.

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A2LA
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Dayton T. Brown, Inc.
Elite Electronic Engineering Inc.
Ingenium Testing, LLC
Intertek
Jacobs Technology
Liberty Labs, Inc
National Technical Systems
Nemko USA
Northwest EMC, Inc.
Qualtest Inc.
RF Exposure Lab, LLC
Timco Engineering, Inc.
TUV Rheinland of North America, Inc.
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Rohde & Schwarz, Inc.

PORTABLE TEST EQUIPMENT
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Advanced Test Equipment Rentals
Aeroflex
Haefely EMC
HV Technologies, Inc.
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Pearson Electronics, Inc.
Thermo Fisher Scientific

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Schurter, Inc.
Syfer Technology
TDK Corporation
V Technical Textiles, Inc./Shieldex U.S.
WEMS Electronics

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Schurter, Inc.
Spectrum Advanced Specialty Products
Syfer Technology
TDK Corporation
Tri-Mag, Inc.
WEMS Electronics

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National Technical Systems
Nemko USA
Timco Engineering, Inc.
TUV Rheinland of North America, Inc.
TÜV SÜD America Inc.
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Instruments for Industry (IFI)

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V Technical Textiles, Inc./Shieldex U.S.

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Communications & Power Industries (CPI)
Instruments for Industry (IFI)
MILMEGA Ltd
Noise Laboratory Co., Ltd.
Ophir RF
TDK Corporation
TESEQ, Inc.
TMD Technologies Ltd

RF POWER METERS
Aeroflex
AR RF / Microwave Instrumentation
ETS-Lindgren
Rohde & Schwarz, Inc.

RF SHIELDING GASKETS
ARC Technologies, Inc.
Nolato Silikonteknik
Spectrum Advanced Specialty Products
Spira Manufacturing Corp.
Tech-Etch, Inc.
Vanguard Products Corp.

RF SHIELDING MATERIAL
Spectrum Advanced Specialty Products
Spira Manufacturing Corp.
Tech-Etch, Inc.
V Technical Textiles, Inc./Shieldex U.S.
Vanguard Products Corp.

RS03<200 V/METER TESTING
Alion Science and Technology
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National Technical Systems
Nemko USA
Thermo Fisher Scientific
TÜV SÜD America Inc.
White Sands Missile Range - SVAD

RTCA DO-160 TESTING
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Dayton T. Brown, Inc.
Elite Electronic Engineering Inc.
Ingenium Testing, LLC
National Technical Systems
Nemko USA
Northwest EMC, Inc.
Panashield, Inc.
Qualtest Inc.
Thermo Fisher Scientific
TÜV SÜD America Inc.
Underwriters Laboratories

SCIF DESIGN, CONSTRUCTION, & MAINTENANCE
ETS-Lindgren
Panashield, Inc.

SHIELDED AIR FILTERS
ETS-Lindgren
Laird Technologies
Leader Tech, Inc.
Spira Manufacturing Corp.
Tech-Etch, Inc.

SHIELDED BUILDINGS
Advanced Test Equipment Rentals
ETS-Lindgren
Panashield, Inc.
V Technical Textiles, Inc./Shieldex U.S.

SHIELDED CABLE ASSEMBLIES & HARNESSES
Dynamic Sciences International, Inc.
Vermillion, Incorporated

SHIELDED COMPONENTS
Schurter, Inc.
Spira Manufacturing Corp.
Tech-Etch, Inc.
Vermillion, Incorporated

SHIELDED DOORS
ETS-Lindgren
Panashield, Inc.
TDK Corporation
V Technical Textiles, Inc./Shieldex U.S.

SHIELDED FANS
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Laird Technologies
Leader Tech, Inc.
Spira Manufacturing Corp.
Tech-Etch, Inc.

SHIELDED ROOM FILTERS
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ETS-Lindgren
Panashield, Inc.
V Technical Textiles, Inc./Shieldex U.S.

SHIELDED ROOMS
Advanced Test Equipment Rentals
Applied Electromagnetic Technology
Detectus AB
ETS-Lindgren
Panashield, Inc.
Swift Textile Metalizing LLC
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National Technical Systems
Panashield, Inc.
V Technical Textiles, Inc./Shieldex U.S.

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ETS-Lindgren

SHIELDED TUBING
Laird Technologies
Vanguard Products Corp.

SHIELDING
AR Tech Engineered Fabric Products
Intermark (USA) Inc.
Isodyne, Inc.
Metal Textiles Corp.
Mitsubishi Gas Chemical Company, Inc.
Swift Textile Metalizing LLC
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SHIELDING EFFECTIVENESS TESTING
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Elite Electronic Engineering Inc.
ETS-Lindgren
Intertek
Leader Tech, Inc.
National Technical Systems
Nemko USA
Northwest EMC, Inc.
Panashield, Inc.
Qualtest Inc.
TÜV SÜD America Inc.
Underwriters Laboratories
White Sands Missile Range - SVAD

SHIELDING, MAGNETIC FIELD
Spira Manufacturing Corp.
Vanguard Products Corp.

SIGNAL GENERATORS
Advanced Test Equipment Rentals
Aeroflex
Agilent Technologies, Inc
AR RF / Microwave Instrumentation
Rohde & Schwarz, Inc.

SIGNAL LINE FILTERS
Captor Corporation
ETS-Lindgren
Laird Technologies
Spectrum Advanced Specialty Products
Syfer Technology
TDK Corporation
V Technical Textiles, Inc./Shieldex U.S.

SITE ATTENUATION TESTING
Alion Science and Technology
Dayton T. Brown, Inc.
ETS-Lindgren
National Technical Systems
Nemko USA
Panashield, Inc.

SITE SURVEY SERVICES
Alion Science and Technology
Dayton T. Brown, Inc.
ETS-Lindgren
National Technical Systems
Nemko USA
Qualtest Inc.

SOFTWARE, EMI/EMC RELATED
2comu

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Electro-Magnetic Applications, Inc.
NEC Corporation
NEXIO
Sigrity, Inc.
SPEAG (Schmid and Partner Engineering AG)

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Instruments for Industry (IFI)
MILMEGA Ltd

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Dynamic Sciences International, Inc.
Detectus AB
Rohde & Schwarz, Inc.

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TÜV SÜD America Inc.
Underwriters Laboratories

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TELCORDIA TESTING

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Intertek
National Technical Systems
Nemko USA
Thermo Fisher Scientific
TÜV SÜD America Inc.
Underwriters Laboratories

TELECOMMUNICATIONS TEST NETWORKS

Advanced Test Equipment Rentals
Agilent Technologies, Inc.
HV Technologies, Inc.
Ophir RF

TEM CELLS

Advanced Test Equipment Rentals
ETS-Lindgren
Fischer Custom Communications, Inc.
Instruments for Industry (IFI)
Noise Laboratory Co., Ltd.
Rohde & Schwarz, Inc.
TESEQ, Inc.

TEMPEST FILTERS

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Curtis Industries, Inc.
Spectrum Advanced Specialty Products
Syfer Technology

TEMPEST TESTING/ TEST EQUIPMENT

Advanced Test Equipment Rentals
A.H. Systems, Inc.
Dayton T. Brown, Inc.
Dynamic Sciences International, Inc.
Fischer Custom Communications, Inc.
National Technical Systems
Panashield, Inc.
Rohde & Schwarz, Inc.

TEST ACCESSORIES

Advanced Test Equipment Rentals
AR RF / Microwave Instrumentation
EM TEST USA
ETS-Lindgren
Fischer Custom Communications, Inc.
Instruments for Industry (IFI)
Ophir RF
Pearson Electronics, Inc.
TDK-Lambda Americas Corp.

TEST ANTENNAS

A.H. Systems, Inc.
Advanced Test Equipment Rentals
AR RF / Microwave Instrumentation
EMSCAN Corporation
Instruments for Industry (IFI)
Rohde & Schwarz, Inc.
TDK Corporation
TESEQ, Inc.

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Advanced Test Equipment Rentals
AR RF / Microwave Instrumentation
Instruments for Industry (IFI)
TESEQ, Inc.

TEST EQUIPMENT, REPAIR & CALIBRATION

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ETS-Lindgren
Fischer Custom Communications, Inc.
Instruments for Industry (IFI)
Noise Laboratory Co., Ltd.
Pearson Electronics, Inc.
Techmaster Electronics, Inc.
TESEQ, Inc.

TEST INSTRUMENTATION

EMC Partner
EMI Instrumentation
Amber Precision Instruments, Inc.
TDK-Lambda Americas Corp.

TESTING

DNB Engineering, Inc
Electronics Test Centre (ETC)
NAVAIR
Retlif Testing Laboratories
Southwest Research Institute
Swift Textile Metalizing LLC

TESTING LABORATORIES

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D.L.S. Electronic Systems, Inc.
Dayton T. Brown, Inc.
Elite Electronic Engineering Inc.
Ingenium Testing, LLC
Jacobs Technology
Liberty Labs, Inc.
National Technical Systems
Nemko USA
Northwest EMC, Inc.
Qualtest Inc.
Retlif Testing Laboratories
RF Exposure Lab, LLC
Sprinkler Innovations
Thermo Fisher Scientific
Timco Engineering, Inc.
TUV Rheinland of North America, Inc.
TÜV SÜD America Inc.
Underwriters Laboratories

TRAINING, SEMINARS, & WORKSHOPS

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China Electrotechnical Society (CES)
CST of America, Inc.
D.L.S. Electronic Systems, Inc.
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Kimmel Gerke Associates, Ltd.
Leader Tech, Inc.
Moss Bay EDA/IBM
TESEQ, Inc.
TUV Rheinland of North America, Inc.
TÜV SÜD America Inc.
Underwriters Laboratories

TRANSIENT DETECTION & MEASURING EQUIPMENT

Advanced Test Equipment Rentals
AR RF / Microwave Instrumentation
Pearson Electronics, Inc.

TRANSIENT GENERATORS

Advanced Test Equipment Rentals
AR RF / Microwave Instrumentation
EM TEST USA
Fischer Custom Communications, Inc.
Haefely EMC
HV Technologies, Inc.
Noise Laboratory Co., Ltd.
TESEQ, Inc.
Thermo Fisher Scientific
Transient Specialists, Inc.

TRAVELING WAVE TUBE AMPLIFIERS

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Communications & Power Industries (CPI)
Instruments for Industry (IFI)
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Fischer Custom Communications, Inc.
Haefely EMC
Rohde & Schwarz, Inc.

WIRE & CABLE FILTERS

Laird Technologies
Spectrum Advanced Specialty Products

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M. Fernandez-Chimeno, F. Silva, Universitat Politècnica de Catalunya (UPC)

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Z. Yu, Missouri University of Science and Technology; J. Koo, J. A. Mix, K. P. Slattery, Intel Corporation; J. Fan, Missouri University of Science and Technology

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Development of Equivalent Circuit Model with Transmission Line Model for Designing Filter Formed on Printed Circuit Boards
K. Matsumoto, Y. Toyota, K. Iokibe, R. Koga, Okayama University

Improvement of Simultaneous Switching Noise Simulation Considering On-Chip Capacitance
K. Ota, K. Matsuge, Toshiba Corporation; Y. Takahashi, T. Sudo, Shibaura Institute of Technology

Multichannel Pseudo-Differential Links
F. Broyde, E. Clavelier, Excem

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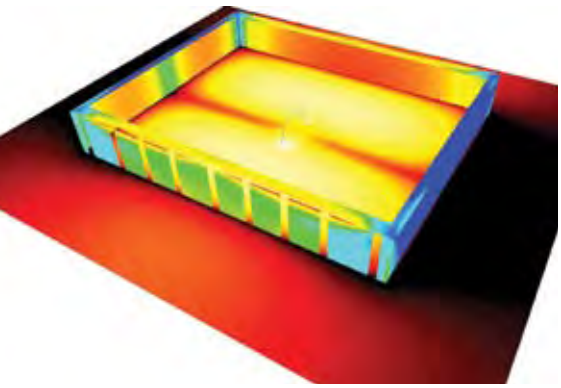

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