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Workshop INCEMIC 2018 (November 13 - 14, 2018)

Programme Schedule

Venue:
NIMHANS Convention Centre, NIMHANS,
Hosur Road, Wilson Garden,
Bengaluru, India

November 13, 2018 (Tuesday)

VENUE : AUDITORIUM- I

08:15 – 09:00	Registration		
09:00 – 09:30	Workshop Inauguration		
09:30 – 10:00	High Tea		
Tutorial Session I			
10:00 – 11:30	1H:30M	Mr. Garth D’Abreau Director, Automotive Solutions, ETS Lindgren, USA	<i>Emissions and Immunity Testing using GTEM Cells and some of the Potential Causes of Error</i>
11:30 – 11:45	Tea break		
11:45 – 13:15	1H:30M	Dr. V. Srinivasulu Reddy EMI- EMC Expert, Robert Bosch, Bengaluru, India	<i>EMC for IoT Devices</i>
13:15 – 14:00	Lunch Break		
Tutorial Session II			
14:00 – 15:00	1H:00M	Dr. Vignesh Rajamani VP, Member Services, IEEE EMC, USA	<i>A Practitioners Approach to EMC Testing with Reverberation Chambers</i>
15:00 – 16:00	1H:00M	Dr. Flavia Grassi Associate Professor, Politecnico di Milano, Milan, Italy	<i>Worst Case and Statistics of Waveforms Involved in Wideband Intentional Electromagnetic Attacks</i>
16:00 – 16:15	Tea Break		
16:15 – 17:30	1H:15M	Dr. Zhong Chen IEEE EMC Society Distinguished Lecturer 2018-2019 & Director RF Engg, ETS-Lindgren, USA	IEEE Distinguish Lecture (Open to all IEEE members) <i>“Theory & Applications of EMC Field Probes”</i>
End of Day 1			

November 14, 2018 (Wednesday)

VENUE : AUDITORIUM- I

Tutorial Session III			
09:00 – 10:15	1H:15M	Prof. (Retd.) M.K. Gunasekaran Ex- Professor, IISc, Bengaluru, India	<i>EMI Issues in Power Electronics</i>
10:15 – 10:45	Tea break		
10:45 – 12:00	1H:15M	Dr. Bhyrav Mutnury Senior Distinguished Engineer, DELL EMC, Bengaluru, India	<i>High Speed Signal Integrity Challenges</i>
12:00 – 13:15	1H:15M	Mr. Martin Wiles Director, Strategy and Business Development, Albatross Projects, Germany	<i>IEC/CISPR Standardization Update</i>
13:15 – 14:00	Lunch Break		
Tutorial Session IV			
14:00 – 15:15	1H:15M	Dr. Jordi Soler VP Global Business Development (EM Solutions), Altair, South Africa	<i>Computational EM Techniques (CEM) & CEM Software Case Study</i>
15:15 – 15:45	Tea Break		
15:45 – 17:00	1H:15M	Dr. M H Kori Formal Technology Director, Alcatel-Lucent Technologies, Bengaluru, India	<i>EMI Issues in 5G Communications</i>
17:00 – 17:30 - Workshop Conclusion			

Mr. Garth D’Abreau

**Director, Automotive Solutions,
ETS - Lindgren, USA**



**Topic : “Emissions & Immunity Testing using GTEM
Cells and some of the Potential Causes of Errors”**

**Date: Nov 13, 2018 (Tue)
Auditorium – I
10:00-11:30 Hrs (01H:30M)**

Bio – data: Garth D’Abreau is the Director, Automotive Solutions at ETS-Lindgren, Cedar Park, Texas. He has primary responsibility for the design and development functions within the Systems Engineering group, specializing in turn-key solutions for Automotive EMC and Wireless test integration. Some of these more complex full vehicle test chambers involve his coordination with the certified, internal Building Information Modeling team. He is an expert and responsible for the ongoing R&D of Automotive/Wireless EMC test chambers for Electric, Hybrid Vehicles, GTEM cells, EMP and wireless device test systems. He is also responsible for anechoic chamber, E- Field generator, TEM device and instrumentation system design and development. Mr. D’Abreau is noted in the industry for his numerous contributions to the development of reverberation chamber design and test methods. He is an invited lecturer at EMC conferences worldwide. Mr. D’Abreau is a member of the IEEE EMC Society and in standards development, ISO and CISPR D automotive EMC standards, with over 30 years of experience in the RF industry. He holds a B.Sc degree in E&C Engineering, from North London University, UK

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Abstract: EMC immunity and emissions testing remains a key phase in the development and validation of the electric and electronic modules used across several industries. GTEMs were introduced as an efficient, cost effective alternative to larger SAC’s, the operating fundamentals and optimum performance requirements, as well as some of the main pitfalls will be presented.

Dr. V. Srinivasulu Reddy

**EMI-EMC Expert, Robert Bosch,
Bengaluru, India**

Topic : “EMC for IoT Devices”



Date: Nov 13, 2018 (Tue)
Auditorium – I
11:45-13:15 Hrs (01H:30M)

Bio – data: V. S. Reddy was born in Nellore, India, in 1972. He received the B.Tech degree in electronics and communication engineering from JNTU, Hyderabad, India in 1994 and M.Tech and Ph.D in microwave engineering, from the Indian Institute of Technology (IIT), Kharagpur, India, in 1996 and 2000 respectively. He was with the Central Research Laboratory and Honeywell, Bangalore, India, from 2000 to 2012. Since 2012, he has been involved in electromagnetic compatibility (EMC) simulations for automotive products and RF design support for IoT devices at Robert Bosch Engineering and Business Solutions Private Limited, Bengaluru. He is senior member of IEEE. He has published more than 30 research articles in leading journals and conference proceedings. His current research interests include computational electromagnetics, modeling and simulation methods for EMC, and RF/Antenna design for wireless systems.

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Abstract:

This workshop session aims to describe the challenges related to the Electromagnetic Compatibility (EMC) for Internet of Things (IoT) devices. Also, provides the regulatory requirements to the EMC/RF aspects of the wireless products and some of the solutions to the challenges posed in such a products. In addition, the challenges posed by the mass increase of lower power wireless networks to the EM environment is also discussed.

Dr. Vignesh Rajamani

Vice President, Member Services, IEEE EMC
USA



Topic : “A Practitioners Approach to EMC Testing Using Reverberation Chambers”

Date: Nov 13, 2018 (Tue)
Auditorium – I
14:00-15:00 Hrs (01H:00M)

Bio – data: Dr. Vignesh Rajamani is an expert in the electromagnetic characterization and application of reverberation chambers and holds a position of Senior Associate at Exponent. A main thrust of his research and project experience in the area of reverberation chambers has been towards increasing test accuracy. His expertise includes statistical electromagnetics, validation and optimization techniques for computational electromagnetics, communication system test in complex multipath environments, EMI/C Issues with Unmanned Aerial Systems, antenna systems and radio frequency (RF) design, and estimation probability of failure of electronic systems due to electromagnetic interference and compatibility. He is the Vice President of Member Services for the IEEE Electromagnetic Compatibility (EMC) Society and involved with several technical committees and educational activities through the EMC Society. He is a Senior Member of IEEE and served as a distinguished lecturer for the IEEE EMC Society for term 2013-2014. He has lectured around the world on reverberation chamber test methodologies and has taught design engineering seminars for faculty and students at many universities focusing on challenges in engineering education and prepare the faculty to handle them by spreading a significant number of Project Based Learning (PBL) classes across the curriculum. Prior to joining Exponent, Dr. Rajamani was with Oklahoma State University (OSU) as a Visiting Assistant Professor where he taught courses in engineering design and performed research in probability of failure of electronic systems in harsh electromagnetic environments. He has also taught the reverberation chamber course at OSU for the past 10 years and served as subject matter expert for various standard bodies

E-mail: vignesh@ieee.org

Abstract: This talk discusses the efficiency of reverberation chambers to perform emissions and immunity tests. The statistically isotropic, randomly polarized, and uniform electromagnetic environment present inside a well stirred reverberation chamber enables a robust, all aspect angle test. The controllable uncertainty of a reverberation chamber test method provides the test engineer options to design a test depending on whether the test is a simple product qualification test or a mission critical system test.

Dr. Flavia Grassi

Associate Professor, Politecnico di Milano,
Milan, Italy

**Topic : “Worst Case and Statistics of Waveforms
Involved in Wideband Intentional EMI (IEMI) Attacks”**



Date: Nov 13, 2018 (Tue)
Auditorium – I
15:00-16:00 Hrs (01H:00M)

Bio – data: Dr. Flavia Grassi received the M.S. and Ph.D. degrees in EE from Politecnico di Milano, Milan, Italy, in 2002 and 2006, respectively, where she is currently an Assistant Professor with the Department of Electronics, Information and Bioengineering. Her research interests include characterization of measurement setups for EMC testing (aerospace and automotive sectors), and application of the powerline communications technology on ac and dc lines. Dr. Grassi was awarded the International Union of Radio Science (URSI) Young Scientist Award in 2008, and the IEEE Young Scientist Award at the 2016 Asia-Pacific Int. Symp. on EMC. She was a recipient of the IEEE EMC Society 2016 Transactions Prize Paper Award, and of the Best Symposium Paper Award from the 2015 Asia-Pacific International Symposium on EMC.

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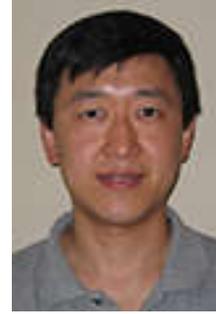
Abstract: This talk is concerned with the assessment of radiated susceptibility of a victim system subject to wideband, intentional electromagnetic interference. It is shown that the high-power electromagnetic (HPEM) pulses giving rise to worst-case interference, according to predefined susceptibility criteria, can be readily determined thanks to a reciprocity-based approach.

Dr. Zhong Chen

**IEEE EMC Society Distinguished Lecturer 2018-19 &
Director RF Engg, ETS-Lindgren, USA**

Topic : “Theory & Applications of EMC Field Probes”

**IEEE Distinguish Lecture
(Open to all IEEE members)**



**Date: Nov 13, 2018 (Tue)
Auditorium – I
16:15-17:30 Hrs (01H:15M)**

Bio – data: Dr. Zhong Chen is the Director of RF Engineering at ETS-Lindgren, located in Cedar Park, Texas. He has over 20 years of experience in RF testing, anechoic chamber design, as well as EMC antenna and field probe design and measurements. He is an active member of the ANSI ASC C63 committee and chairman of subcommittee 1 which is responsible for the antenna calibration and chamber/test site validation standards. He is chairman of the IEEE standard 1309 committee responsible for developing calibration standards for field probes, and chairman of the IEEE standard 1128 committee for absorber measurements. His research interests include measurement uncertainty, time domain measurements for site validation and antenna calibration, development of novel RF absorber materials, and anechoic chamber designs. Zhong Chen received his M.S.E.E. degree in electromagnetics from the Ohio State University at Columbus.

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Abstract: This presentation will provide an introduction on the basic operation principles of EMC field probes, and explain parameters of probes such as types of probes, frequency response, linearity, isotropy, and sensitivity. Calibration and applications of the field probes are discussed. The presentation aims to provide background information so a user can better understand the specifications of a typical probe datasheet, and facilitate the understanding of how to select the best field probe based on his/her application. Discussion on the applications of the field probe will include factors that can influence measurement uncertainties, such as probe orientations with respect to incident field, fixtures, properly applied correction factors, and how probes readings can be impacted under modulated or other complex signals.

Prof. (Retd.) M.K. Gunasekaran

**Ex-Professor, Indian Institute of Science
Bengaluru, India**

Topic : “EMI Issues in Power Electronics”



Date: Nov 14, 2018 (Wed)
Auditorium – I
09:00-10:15 Hrs (01H:15M)

Bio – data: Retired prof. from IISc, Bengaluru. Worked in the EMC area and produced several Ph.d 's and published several papers. Conducted EMC course for the PG students over 30 years. Received teaching excellence award from Indian Institute of science. Currently running a small-scale electronic industry.

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Abstract: Conducted noise generation in switching circuits. Calculations in frequency domain. Conducted noise reduction techniques. Line filter design. Radiated noise sources and reduction techniques.

Dr. Bhyrav Mutnury

**Senior Distinguished Engineer
Infrastructure Solutions Group, DELL EMC
Bengaluru, India**

Topic : “High Speed Signal Integrity Challenges”



**Date: Nov 14, 2018 (Wed)
Auditorium – I
10:45-12:00 Hrs (01H:15M)**

Bio – data: Dr. Bhyrav Mutnury is a Senior Distinguished Engineer and Global Team Lead at Enterprise Signal Integrity group at Dell EMC, where he is responsible for storage, network, rack and blade server designs. Dr. Mutnury is driving the next generation high speed interfaces and modeling methodologies at Dell. His innovative design of experiments based methodologies and integrated tool suite to model high speed SerDes for electrical and physical designs has provided 50X-100X improvement on the productivity. He is the electrical interface expert on GbE, XAUI, FC, USB, PCIe, UPI, DDR and SAS. He has more than 18 years of progressive experience in system design with strong focus on electrical modeling, analysis and optimization of complex high speed servers. The research pioneered by Dr. Mutnury not only resulted in faster design spins of complex servers but also resulted in cost savings in designs without trading off signal integrity robustness. Dr. Mutnury was involved in numerous research projects with Georgia Institute of Technology, Missouri Institute of Science and Technology, Penn State University, Indian Institute of Sciences (IISc) and National Taiwan University (NTU). Dr. Mutnury has authored and co-authored more than 75 refereed publications in various IEEE and non-IEEE conferences. These publications covered various disciplines including package and interconnect modeling, analysis and optimization; active circuit and transistor level circuit macro-modeling; high speed serial and multi drop interface design, modeling and optimization. Dr. Mutnury has 110 issued patents and another 60 more filed in the fields of electrical cable design, package and printed circuit board design and optimization, and electrical design space exploration using evolutionary techniques. He is currently a senior member of Institute of Electrical and Electronic Engineers (IEEE). He received his Master of Science degree in Electrical Engineering in 2002 and Doctor of Philosophy degree in Electrical Engineering in 2005 from the Georgia Institute of Technology, Atlanta, GA.

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Abstract: With the signal speeds doubling every generation, signal integrity (SI) challenges in high speed systems are becoming difficult to tackle. As the signal speeds go beyond 25 Gbps, SI parasitic effects that previously were benign begin to impact SI significantly. In this workshop, current SI challenges and some potential solutions to get around them would be discussed.

Mr. Martin Wiles

**Director, Strategy and Business Development,
Albatross Projects, Germany**

Topic : “IEC/CISPR Standardization Update”



Date: Nov 14, 2018 (Wed)
Auditorium – I
12:00-13:15 Hrs (01H:15M)

Bio – data: Martin Wiles holds a BSc. Physics (1987), MSc in Microwave Electronics (1988) and an MBA (2015). He is currently Director, Strategy and Business at Albatross Projects from Germany, based in the UK and responsible for overseeing global strategic projects. Over the last 30 years as an RF Engineer he has been involved in the design and testing of 100s of EMC and RF Microwave antenna chambers and more recently in the delivery of both EMC and OTA Wireless systems in Europe. He has been participating in EMC standardization work since 2005 as a member of the UK National EMC Committee and at international level represents the UK on CISPR A, responsible for CISPR 16. In 2016 he was awarded the IEC 1906 award for work on EMC Chamber validation > 1GHz

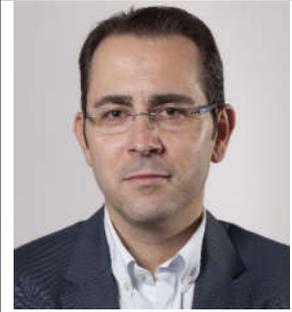
E-mail: M.Wiles@albatross-projects.com

Abstract: This workshop will provide a summary of the latest activities within the IEC/CISPR standardisation work and follows the annual meetings in South Korea in October. A focus will be provided on changes to CISPR 11,14,15,16 and 32 including radiated measurements below 30MHz. Developments within the automotive standards CISPR 12,25,36 will also be discussed.

Dr. Jordi Soler

**VP Global Business Development (EM Solutions),
Altair, USA**

**Topic : “The Growing Role of EMC Simulation
Through New Use Cases and Methodologies
Across Multiple Key Industries”**



**Date: Nov 14, 2018 (Wed)
Auditorium – I
14:00-15:30 Hrs (01H:30M)**

Bio – data: Dr. Jordi Soler is Vice President of Global Business Development for Altair's electromagnetic solutions, including FEKO electromagnetic simulation software, one of Jordi's passions since 2000.

Dr. Jordi has 20+ years' industrial experience and a strong background in electromagnetics and in computational electromagnetics related to multiple areas, including antennas, EMC, RCS and electronics. He has occupied several business development and engineering management positions and led multiple product development projects for many industries, including automotive, aerospace, military, electronics, wireless and telecommunications.

He has won several international awards and is co-inventor of +20 patents. Also, he is author of 100+ papers and articles and has co-chaired multiple international industrial panel discussions and conference sessions.

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Abstract:

The usage of simulation for EMC applications is growing rapidly in a scenario where development processes are changing from measurement driven to simulation driven due to factors such as fewer hardware prototypes being available and less time for measurements and testing. As a result, a lot of attention is placed on EMC simulation of emissions and immunity at both platform and component levels. This talk will discuss the situation today for EMC simulation and will give insights on its future, all this explained through a broad set of use cases and customer case studies from different industries, including automotive, aerospace, defense and telecom.

Dr. M H Kori

**Former Technology Director,
Alcatel-Lucent Technologies, Bengaluru, India**

Topic: “EMI Issues in 5G Communications”



**Date: Nov 14, 2018 (Wed)
Auditorium – I
15:45-17:00 Hrs (01H:15SM)**

Bio – data: Dr. M.H.Kori is one of the leading Wireless & Mobile Telecommunication experts. He has more than 40 years’ experience in Telecom, RF, Microelectronics & IT. His research, industrial and academic experiences include work at Alcatel-Lucent Technologies as Technical Director & also as Head of Hyderabad R&D Unit; Head of Wireless Division C-DOT; VP Geosoft Technologies; Head Telecom DSQ Software; IIT Bombay; University of Duisburg, Germany; Advisor Validus Technologies USA.

His Professional Contributions include extensive research work in Wireless & Mobile Communications, head of architecture team in Lucent Technologies working on many technologies leading to 5G; Digital Microwave development at C-DOT; Visiting Fellow at University of Duisburg Germany, designed MMIC Chips fabricated at Daimler Benz MMIC Foundry, Germany; Member of several advisory & standards committees - Study Group NWG 9 of ITU-R; guided students for MS/PhD at IISc/BITS & other Institutes; Member of Advisory Committee / Academic Council for many Institutes / Universities.

He has published and presented many papers in Journals & Conferences, conducted workshops at National & International Conferences, has been the Chair, Co-Chair of several Conferences, Co-author, Contributing Editor and Co-editor of Books, Conference Proceedings. His recent Invited Talks include talks at IEEE Panel Discussion on 5G for India, Invited Talk on 5G at International GIFSI Workshop. He is the Organizing Chair of the International Radar Symposium and International Symposium on Microwaves.

Dr Kori is the Chairman of International Microelectronics & Packaging Society (IMAPS) India, past TPC Chairman of IETE, past Chairman IETE Bangalore Centre, past Vice Chairman of IEEE MTT & ED Society, past EC Member IET. He is the recipient of RVCE World Telecom Day Award & IETE Batra Memorial Award. He is a Distinguished Fellow of IETE

His Areas of interest include Wireless Communications, 5G & IoT; Microwaves & MMIC; Microelectronics. Dr Kori holds PhD from IIT Bombay.
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Abstract: The next generation of Mobile Communication Technology, 5G, is just around the corner. Though pre-standard systems and initial field trials are operational, commercial implementation is likely to be in 2020. Unlike the progression of the earlier generation, from 2G to 3G to 4G, where the emphasis had been primarily about the broadband and higher data rates, 5G has added two more dimensions. 5G is based on three objectives (1) eMBB – Enhanced Mobile Broadband (2) mMTC – Massive Machine Type Communications (3) uRLLC – Ultra-High Reliable Low-Latency Communications. In the light of these new additional requirements, the issues related to EMI / EMC in 5G become lot more critical. Massive number of devices being added to the wireless network with the advent of IoT makes EMI scenario more complex. The requirement of ultra-reliable and low-latency applications make demand on design of EMI / EMC stringent. Some EMC aspects associated with 5G Networks will be discussed in the context of new 5G standards and CISPR Standards.