

# EMC of Smart Electric Vehicles

## ORGANIZERS:

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## ABSTRACT:

With the increasing of complex electromagnetic environment problems in Internet of Vehicles technology, electromagnetic environment testing for Internet of Vehicles becomes great challenges. This workshop will present the testing technologies and instruments of the electromagnetic environment for Internet of Vehicles.

## TALKS:

### **Module-Level Noise Source Characterization - Improving the Consistency between Module- and Vehicle-Level EMC Evaluations**

*Jun Fan, Missouri University of Science and Technology*

### **EMC Testing of Intelligent Internet of Vehicle**

智能网联车移动终端电磁环境测试

*LI Er-Ping, Zhejiang University*

### **Time-Domain EMI Testing and its Applications in Automotive Testing**

时域测试接收机及其在汽车 EMC 测试中的应用

*Li Zhong Qun, Ceyear Technologies Co., Ltd (中电集团思仪科技有限公司)*

### **EMC Testing Technology adapting to the trend of Automobile Electrification and Intelligence**

适应汽车电动化和智能化趋势的电磁兼容检测技术

*Shen Xueqi, Compliance Direction Systems Co. Ltd*

### **Potential Impact of Power Ground Return on Vehicle-mounted Components**

电源地回流对车载部件的潜在影响

*MA Xuwen, Huawei Technology*

Abstract: In order to reduce corrosion and the number of cables, a negative grounding is usually used on the vehicle. The frame is used as the common reference ground to connect all the negative power supply leads of all components. Under this architecture, severe common ground interference may occur when the ground points of the vehicle-mounted components are corroded or poorly connected.

### **RF EMF Radiation Exposure Assessment of vehicles: Analysis, Computation and Mitigation Methods**

车辆 RF EMF 辐射暴露评估：分析、计算和管控方法

*Yang Lu, Huawei Technology*

Abstract: Electric Vehicles (EV) is experiencing a rapidly growth in the transportation systems worldwide. The higher power components used in the vehicles are possible source of extremely low frequency electric and magnetic fields. The wireless communication applications in high frequency range such as vehicle to everything (V2X) are also integrated into advanced cars. There has been public concern about the EMF exposure level from those new transportation technologies. The health effects of EMF

exposure from transportation systems remain unclear. It is necessary to analysis and assess the EMF issues in electric vehicles.

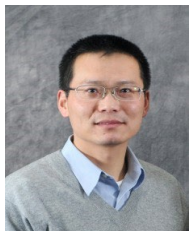
## BIOS OF ORGANIZERS & SPEAKERS



**Zhang Xing Hai** graduated from the Northern Jiaotong University in 1997, is the distinguished chief product certification expert of Huawei Technologies Co., Ltd., who has worked in the EMC, RFI, and EMF fields for more than 20 years, focusing on EMC design, testing, and certification of ICT products, energy products, terminal products, and intelligent network connected vehicles. He is the CCSA TC9 vice-chairman of China Communications Standardization Association, Co- reporter of ITU-T SG5 Question 4 - EMC, and expert member of IEC CISPR. He participated in the development of more than 30 international and domestic EMC, RFI, and EMF technical standards.



**Ren Huasheng** is currently the director of Electromagnetic Engineering Technology Laboratory, 2012Labs, Huawei Technologies, Mr Ren received his B.S. and M.S. degrees in Electrical & Mechanical Engineering from Xidian University separately in 1999 and 2002. Since 2002, he has served as a EMC Enginner, Principal EMC Engineer, EMC Lab Director at Huawei Technologies, His research interests include EMC modeling and design of ICT equipment, EMC test and standardization, innovative material application in EM domain.



**Jun Fan** (Fellow, IEEE) is received B.S. and M.S. degrees from Tsinghua University, Beijing, China, and a Ph.D. from Missouri S&T, Rolla, MO, USA, in 1994, 1997, and 2000, respectively, all in electrical engineering. From 2000 to 2007, he was a Consultant Engineer with NCR Corporation, San Diego, CA, USA. In July 2007, he joined Missouri S&T, where he was a Professor and a Director of the EMC laboratory. He also served as the Director of the National Science Foundation Industry/University Cooperative Research Center for Electromagnetic Compatibility and as a Senior Investigator at the Missouri S&T Material Research Center. He is currently an adjunct professor at Missouri S&T. His research interests include signal integrity and EMI design in high-speed digital systems, DC power-bus modeling, intrasystem EMI and RFI, PCB noise reduction, differential signaling, cable/connector designs, and machine learning applications. Dr. Fan was the recipient of the IEEE EMC Society Technical Achievement Award in August 2009. He is currently an Associate Editor for IEEE TRANSACTIONS ON ELECTROMAGNETIC COMPATIBILITY and IEEE EMC Magazine.



**Er-Ping Li** (Fellow, IEEE) is currently a Qiushi-Distinguished Professor with the Department of Information Science and Electronic Engineering, Zhejiang University, China; the Founding Dean of the Joint Institute of Zhejiang University–University of Illinois at Urbana–Champaign. He was a recipient of the 2015 IEEE Richard Stoddard Award on EMC, the IEEE EMC Technical Achievement Award, the Singapore IES Prestigious Engineering Achievement Award, and the Changjiang Chair Professorship Award from the Ministry of Education in China, and a number of Best Paper Awards.



**Zhong Qun Li** is currently a Senior Engineer and Director of Auto-Measurement with *Ceyear Technologies Co., Ltd at Qingdao (No 41 Institute)*. He obtained his PhD from Northwest Polytechnic University, China in 2010. Since he works for Ceyear, he mainly embarks on the research and development of EMI testing technology. He has carried out number of national and provincial research agencies funded projects, authored 15 papers and holds 8 patents.



**Xueqi Shen** is a Senior Engineer (Professor Grade) and CEO of Compliance Direction Systems Co. Nanjing. 他长期耕耘电磁兼容（EMC）检测技术的研究、开发和应用，作为全国无线电干扰标准化技术委员会 A 分会（无线电干扰测量方法和统计方法）委员和 D 分会（机动车辆和内燃机）通讯委员，参与了多项国家标准的制定。



**Xuewen Ma**, Master of Radio Physics in Xidian University, Principal Engineer, has been engaged in EMC testing and design and EMC technology research for 21 years in Huawei.



**Dr. Yang Lu** received his B.S. degree in communication engineering from Nanjing University of Science and Technology, Nanjing, China in 2004. He received his Ph.D. degree in Electrical Engineering from the University of Liverpool in 2011. From 2012 to 2016, he worked for Yulong Technology, Shenzhen, Guangdong as an Antenna Engineer. In January 2016, he joined Huawei Technology, and he is currently a senior Electrical Engineer. He has been working on the antenna system design and measurement in both telecommunication and portable devices for more than 10 years. His current research interest includes the electro-magnetic radiation (RF EMF) human exposure assessment. Dr.

Lu is currently a member of IEC TC 106 International Electrotechnical Commission.