



17-22 January 2021
Virtual Conference

2021 IEEE Radio & Wireless Week

96th ARFTG Microwave Measurement Symposium

*Wednesday, January 20, 2021
9:45 am – 10:45 am ET*

PANEL SESSION

Uncertainty in mmWave Over-the-Air Test (60 minutes)

Abstract: The panel will explore the challenges of accurate over-the-air (OTA) measurements of new 5G mmWave wireless devices. These devices typically have active, integrated antennas and operate in multiple bands, sometimes over wide bandwidths. The panelists will address questions such as how to ensure accuracy and provide realistic uncertainties for mmWave OTA performance tests, which may need to evaluate characteristics such as beam steering, mobile operation, the use of nulls to block interferers, and metrics such as error vector magnitude (EVM). Trade-offs in various OTA measurement approaches, including the importance of positioning errors, will also be addressed. Join us for a lively discussion of these cutting-edge measurement issues.

Participants:

1. Debabani Choudhury, Principal Scientist, Intel Labs
2. Thorsten Hertel, Lead Technologist, Keysight
3. Jonas Friden, Senior Specialist Over the Air Methodologies, Ericsson Research Radio
4. Benoit Derat, Senior Director of Development, EMC, OTA, antenna and customized test systems, Rohde & Schwarz
5. Gerardo Orozco, Chief RF Systems Engineer at NI
6. Jon Martens, Fellow, Anritsu

Organizers:

Dylan Williams and Kate Remley, NIST Communications Technology Laboratory

A Short Introduction to our Panelists:

Debabani Choudhury joined Intel Labs in 2006. She provides strategic research directions and leads research and development of RF/millimeter-wave technologies for next generation wireless platforms and connected vehicle integration. She has a broad range of expertise in RF, millimeter wave, and terahertz device, circuits, antennas, system, packaging, integration and technologies. She has 25+ years of research experience and holds a PhD degree in Electrical Engineering. Before

joining Intel, she held senior research staff positions at HRL Labs (formerly Hughes Research Laboratories) and Millitech Corporation where she developed various millimeter-wave and terahertz technologies for imaging as well as other space and defense applications. Prior to that, she worked at NASA Jet Propulsion Laboratory (JPL) on THz/submillimeter-wave devices and components for space-based heterodyne receiver applications. Debabani has more than 35 patents/patent applications and numerous publications. She received several NASA awards for her work on heterodyne receivers, devices, multipliers, and guiding structures/ modules developed for space and defense applications. Debabani is an IEEE Fellow.

Benoit Derat received the engineering degree from SUPELEC (Gif-sur-Yvette, France) in 2002 and a Ph.D. degree in physics from University of Paris XI (Orsay, France) with honors in 2006. From 2002 to 2008, he worked at SAGEM Mobiles, as an antenna design and electromagnetics research engineer. During these years, he gained expertise in antenna measurements and simulations, and actively contributed to innovation and international standardization in near-field techniques for human exposure assessment to radiofrequency waves. In 2009, he founded the company ART-Fi, which created the first vector-array SAR measurement system and initiated the IEC 62209-3 standard development. Dr. Derat operated as the CEO and President of ART-Fi until 2017, before joining Rohde & Schwarz at the Munich headquarters. He is now leading the R&D for EMC, OTA, antenna and AD test systems, as Senior Director of Engineering. Dr. Derat is the author of more than 70 scientific conference and journal papers, as well as an inventor on close to 30 patents relating to antenna and electromagnetic field measurements.

Jonas Fridén received the B.S. degree in mathematics and physics and the Ph.D. degree in theoretical physics from the University of Göteborg, Göteborg, Sweden, in 1987 and 1996, respectively. Since 2002, he has been with Ericsson Research, Ericsson AB, Göteborg, Sweden where he is a Senior Specialist in Over-the-Air Methodologies. He has contributed to 3GPP 5G Conformance testing for base stations and is also active in ANSI C63 and NGMN. In 1996 –1999, he was a lecturer with the College University of Borås. In 1999, he was with Ericsson Microwave Systems AB, where he worked with radar antennas, radar system, and radome design. He has also been a member of the European Electromagnetic Data Interface Group. His major areas of research are electromagnetic compliance, OTA measurement techniques, near field techniques, antenna and electromagnetic theory, bandwidth limitations of antennas, and MIMO antenna system performance.

Thorsten Hertel has almost 25 years of antenna design and wireless test experience starting with his post-graduate work at Georgia Tech. He specialized in applied wireless communication and OTA when he managed the antenna design and OTA test teams at Palm/HP. The last few years, he focused on OTA standardization efforts in CTIA and 3GPP RAN4&RAN5 with Rohde&Schwarz and Keysight Technologies, specifically related to testability, measurement uncertainty, and 5G NR FR2 OTA.

Jon Martens has been with Anritsu since 1995 where he works on measurement system architectures, mm-wave circuit and sub-system design and algorithmic development. He is a former associate editor for the Transactions on Microwave Theory and Techniques and is currently a Distinguished Microwave Lecturer for MTT.

Gerardo Orozco serves as Chief RF Systems Engineer at NI (National Instruments) and works closely with many top customers on the latest solutions for testing RF semiconductors in High Volume Manufacturing and in Characterization. With 18 years of experience on high volume production of front end modules, transceivers and phones, Gerardo has worked in different positions on the supply chain of RF devices to improve throughput, accuracy and new measurements. He worked on the core DSP algorithms inside the 2G-4G testers and also for some other IoT protocols. Currently he is systematically improving current OTA methodologies and working with customers to define more cost-effective ways of testing for 5G mmWave AiP. Gerardo holds a BS in Electrical and Communications Engineering from Universidad Iberoamericana in Mexico City and MS in Electrical Engineering from Georgia Tech.