Antenna Array Design & Coverage Analysis of Private Wireless Networks

Workshop 1 :

Title: Antenna Array Design using Frequency Domain Decomposition & Time Domain Numerical Methods

Abstract: As our world becomes more connected, higher data rates will be required to support the transmitted data volume.. Data links at millimeter-wave frequencies as part of the upcoming 5G standards will make this possible. The smaller physical size of antennas and arrays at higher frequencies means they will be seen in many new application areas as agile, responsive beamforming becomes feasible for base stations and user terminals. This will be a critical enabling technology for future wireless applications. The array design capabilities of SIMULIA CST Studio Suite have grown dramatically over the last years and are relied on by many companies around the world.

Speaker:

Biography: Davide Tallini received the Laurea degree in Telecommunication Engineering from "Sapienza" University of Rome in February 2007. His scientific interests during the university were focused on electromagnetic theory and applications in a specific topic: scanning antennas and arrays. At the end of 2007 he joined CST AG as Application Engineer. His main role at DASSAULT SYSTEMES is the SIMULIA EUROMED Technical Manager with focus on electromagnetic simulation. He is as well coordinating the development of the Hybrid Solver inside SIMULIA CST Studio Suite.

Workshop outline:

This presentation the Domain Decomposition method for Antenna Array applications. A modeling and simulation workflow is showcased in CST Studio Suite to quickly generate complex simulation projects and assure robust decomposition for arrays. A base station antenna model is used for benchmarking the frequency domain solution against the established time domain
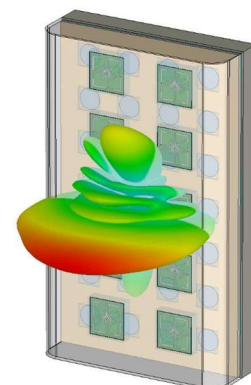
methods. Excellent agreement is obtained and general recommendations are made for MIMO array antennas.

Workshop 2 :

Title: Coverage Analysis of Private Wireless Networks in Industrial Environments

Abstract: Digitalization and wireless connectivity are key enablers of the Industrial Internet of Things (IIoT), also referred to as the "Industry 4.0". Private wireless networks and new standards like 5G enable strategies for more agile and efficient production lines, facilities and plants. The benefits go beyond the connectivity, which is why private networks is a topical subject for the communication industry. In this presentation, we explore how simulation can be used to perform coverage analysis and extract channel information for the proper design of devices and the network for complex industrial environments.

Speaker:

Biography: Rodrigo K. Enjiu graduated in information engineering from UFABC, Brazil in 2012. He joined Dassault Systèmes in 2013 (former CST AG), in Darmstadt, Germany. Since then, he has worked in different technical sales and customer support roles worldwide. Currently, he is a Senior High-Tech Industry Process Specialist working on projects related to 5G and 6G.

Workshop outline:

The presentation will showcase a realistic model of a hangar and demonstrate how the proposed simulation-based approach can be used to analyze coverage and channel characteristics of private networks in complex industrial environments and how the context is important for the proper design. We will also discuss the importance of analyzing coverage and channel characteristics in the proper design of devices and the network.