

11th Management Committee & Technical Meeting

Keynote Talks

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Innovative Over-the-Air Testing Concepts for Future Wireless Systems: Research Insights from Chalmers

Prof. Marianna Ivashina, Chalmers University of Technology, Gothenburg, Sweden

Abstract

Over-the-air (OTA) testing plays a critical role in the development and validation of wireless communication systems, especially as we move toward increasingly integrated devices and diverse application scenarios. At Chalmers University of Technology, in close collaboration with Swedish industrial partners, we explore innovative OTA testing methods to meet the evolving demands of 5G, 6G, and beyond.

This talk will present recent research activities focusing on hybrid OTA chambers and novel plane wave generator (PWG) concepts designed to emulate both line-of-sight and multipath propagation conditions within compact and flexible test environments. Two key research directions will be discussed:

1. Chamber antenna array (CAA)-based PWGs implemented in overmoded waveguide environments for sub-6 GHz applications, and
2. Early-stage prototypes of reconfigurable intelligent surface (RIS)-based PWGs targeting millimeter-wave frequencies.

We will share insights into design trade-offs, modeling approaches, and prototype measurement results, including key performance metrics. Rather than offering finalized solutions, the presentation will highlight open research questions and promising directions emerging from our collaborative research environment, contributing to the broader vision of intelligent, adaptive, and seamless radio communication networks as pursued within the INTERACT action.

Bio

Marianna Ivashina is a Full Professor in Electromagnetic Design of Antenna Systems at Chalmers University of Technology, where she leads the Antenna Systems Group, comprising over 20 senior researchers and PhD students. Her team is internationally recognized for pioneering work on wideband and phased-array technologies for the Square Kilometre Array (SKA) and mm-wave integrated antenna solutions for 5G/6G systems.

She currently serves as Director of WiTECH – Wireless Infrastructure Technology at Chalmers, a Vinnova-funded competence center supported by 18 industrial and academic partners from Sweden, Norway, Germany, Austria, Japan, the USA, and France. Her research interests include active beamforming antenna arrays, reconfigurable antennas, antenna integration with active electronics, and advanced OTA testing methodologies, with applications across wireless communications, satellite systems, radio astronomy, and radar sensing.



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Advances and Challenges in Military Ka-band HWIL Radar Simulator Engineering

Dr. Anders Johansson, Qamcom, Gothenburg, Sweden

Abstract

Advancements in microwave component technology have enabled the transition of radar-based missile seekers to the Ka-band. This presentation will address some of the design complexities associated with developing a hardware-in-the-loop simulator for Ka-band radar seekers. It will emphasize both the engineering and scientific challenges and discuss the evolution and future prospects of digital twin technology and its relationship to AI training.

Bio

Currently serving as the CTO at Qamcom ICX, Anders brings over 15 years of expertise as a systems engineer specializing in radar and electronic warfare systems. His career includes tenures as a researcher at the Swedish Defence Research Agency (FOI) and in industry research and development. He conducted research for his PhD in acoustic signal processing at the University of Western Australia.

