IEEE AWPL Special Cluster 2025 on
"Measurement and Metrology Theory and Technologies for Future 6G Wireless"

A range of advanced wireless technologies is rapidly emerging in the development of 6G wireless systems, including innovations such as integrated sensing and communication, large-scale antenna arrays with diverse beamforming structures, reflective intelligent surfaces, and the exploration of new frequency bands. These pioneering technologies are set to revolutionize industrial practices and significantly transform daily life over the next decade.

The purpose of this special issue is to provide a platform for sharing the latest research on wireless testing and metrology for 6G systems, focusing on large-scale equipment such as vehicles and aircraft. We invite researchers to contribute original papers that address evolving testing methods, including planar, cylindrical, and spherical near-field scanning, as well as novel approaches like source reconstruction, drone-based scanning, and complex surface scanning. Additionally, over-the-air (OTA) measurements are gaining importance as traditional RF cable methods become obsolete. This issue will explore how advancements in artificial intelligence and integrated sensing can enhance the precision and efficiency of testing systems. We welcome both theoretical and experimental works that address the following topics:

- Antenna measurement on large-scale platforms;
- Drone-based antenna measurement theory and technologies;
- New bistatic scattering measurement methods for low-altitude drones, reconfigurable intelligent surface (RIS) antennas;
- Novel efficient antenna measurement theory and techniques;
- Novel phase-less antenna measurement theory and techniques;
- Massive antenna array diagnosis, calibration and characterization;
- Fielding mapping for on-chip antennas;
- Probe technologies in testing systems;
- Recent progress on test using AI;
- Source reconstruction technologies independent of ideal planar, cylindrical, or spherical sampling;
- Measurement technologies in integrated sensing and communication systems;
- New applications of artificial intelligence in the field of measurement;
- Developments of 6G channel sounder, radio channel emulator, and other testbeds for performance testing;
- Channel measurement technologies in 6G mobile communication;
- Sub-Terahertz (sub-THz) and THz components and antennas measurement;
- Massive MIMO, sub-Terahertz and THz channel measurements and characterization;
- Progress in standardization of 6G metrology;

The Guest Editors of this Special Cluster are:

- Dr. Zhengpeng Wang, Beihang University, China wangzp@buaa.edu.cn
- Prof. Wei Fan, Southeast University, China weifan@seu.edu.cn
- Dr. Xiaobang Shang, National Physical Laboratory, UK xiaobang.shang@npl.co.uk
- Lars Foged, Microwave Vision Group, Italy lars.foged@mvg-world.com
- Dr. Benoit Derat, Rohde & Schwarz, Germany Benoit.Derat@rohde-schwarz.com
- Dr. Kun Li, The University of Electro-Communications, Japan li.kun@awcc.uec.ac.jp

Prospective authors are encouraged to contact the Guest Editors for any questions or to determine the suitability of their contribution for this special cluster. Papers should be prepared following the same submission instructions as for regular IEEE AWPL manuscripts (four-pages technical content maximum and one reference page, double-column, IEEE format), available via the Information for Authors website. The authors should indicate in the cover letter to the Editor-in-Chief that the manuscript is being submitted in response to the Call for Papers for the focused cluster. Prospective authors should refer to the timeline below for key dates.

Key dates:

- Submission deadline: **March 31, 2025**
- First decision: May 15, 2025
- Revised manuscripts deadline: June 15, 2025
- Final decision: July 30, 2025
- Final manuscripts due by: September 1, 2025
- Online publication: Shortly after final manuscript submission
- Cluster publication: November (or December) 2025 issue of AWPL