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## Mathematics and statistics for trustworthy measurements and quality assured data: exchanging ideas between metrologists and statisticians

*Tuesday, 16 September 2025 11:30 (1h 30m)*

Metrology is the science of accurate, reliable and traceable measurements with results expressed in the internationally recognized SI system of units. EMN Mathmet is the European Metrology Network for Mathematics and Statistics, offering a platform for exchange, cooperation and strategic planning for mathematical and statistical experts working at European national metrology institutes (NMIs) and designated institutes (DIs). Mathmet's vision is to ensure quality and trust in algorithms, software tools and data for metrology, and in inferences made from such data, to foster the digital transformation, industrial competitiveness, climate change mitigation, health and environment safety, energy and society sustainability. In recent years, Mathmet published a Strategic Research Agenda, a set of Quality Assurance Tools for data, software and guidelines, an overview Report on existing guidelines, software tools and reference data, and organized a Measurement Uncertainty Training Activity, all of which can be found at the Mathmet website <https://www.euramet.org/european-metrology-networks/mathmet>.

In this conference session, mathematicians and statisticians from Mathmet would like to exchange ideas with the wider maths & stats community on the topic of trustworthy measurements and quality assured data, and the methods and tools required for this. After a general introduction of EMN Mathmet, two case studies will be presented. The first case study relates to a recently started project that focuses on validating both classical and AI-based algorithms which can be used to predict power flows and unwanted events in the electrical grid. In the second case study, the application of Bayesian methods in metrology, e.g., for analysing interlaboratory comparison data or other measurement data, is discussed.

In both case studies, the main challenges will be presented and an active interaction and discussion with the audience will be appreciated. The session will round up with some concluding remarks by the chair of EMN Mathmet.

**Presenters:** PENNECCHI, Francesca (Istituto Nazionale di Ricerca Metrologica - INRIM); KOK, Gertjan (VSL); DE-MEYER, Séverine (Laboratoire National de Métrologie et d'Essais)

**Session Classification:** Exchanging ideas between metrologists and statisticians Invited Session