EURAMET TC-M Working Group on Dynamic Measurements, WGDM

Objectives of the Working Group

TC for Mass and Related Quantities (M)
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EURAMET TC-M Working Group on Dynamic Measurements - Aim of the Working Group

Background

The Working Group on Dynamic Measurements (WGDM) was created by TC-M to identify, address and raise awareness of generic issues related to dynamic metrology, and to work on a solution, including metrological standards and measurement method development.

A key feature of dynamic measurement is that the relationship between a time-varying quantity being measured and a time-varying input is described using differential equations, which account for rates of change[1]. However, in many cases, the indication of a measurement system is assumed to represent the instantaneous value of the measurand and the relationship between the input and the output quantities is simply described by an algebraic equation, which in turn limits the accuracy and undermines the true potential of the measurement device.

The aim of the working group

Focusing on the specific requirements related to dynamic metrology, the overall aim is to ensure consistency and reliability in industrial and societal measurement where the dynamic characteristics of the measurement system is required. This includes development of standard calibration methods, uncertainty evaluation, traceability infrastructure and metrological evaluation of the dynamic in-process measurements. To ensure traceability in measurements, this knowledge must be applied not only at NMI level but throughout the traceability chain to final users of measurement results.

This includes collaboration with, for example, industrial and regulatory stakeholders to ensure that the capability of dynamic metrology meets current and future requirements in industry and society and to ensure that the infrastructure for mass and related quantities within the NMIs (and DIs) in Europe is fit-for-purpose and internationally competitive for the benefit of Europe's multi-sector user community. (This is consistent with the general aims and scope of the EURAMET Technical Committees).

The objectives of the TC-M WGDM

To achieve the aim, the work of the WGDM includes (but is not limited to) the following activities:

- Provide a roadmap and a strategy on dynamic metrology related to the quantities covered by the TC-M.
- Support the CCM Task Group on Dynamic Metrology (CCM TGDM) in the development of unified nomenclature, strategies on comparisons, uncertainty calculations, traceability chain and KCDB CMC statements.
- Support EURAMET TC-M members to develop their metrological capabilities and knowledge in the area. This includes having an overview of capabilities and ongoing work in the areas including research projects and stakeholder interest.

[1] Trevor Esward *et al* 2019 *Metrologia* **56** 015002 (**DOI** 10.1088/1681-7575/aaeeba)

- Promote research and collaboration with stakeholders and the wider community.
- Promote and coordinate the development of guidance documents in dynamic metrology, for example calibration and industrial good practice guides and guidelines on uncertainty evaluation.
- Engage with other EURAMET TCs in the development of mutual understanding and exchange of expertise within the community (most relevant are the TC-AUV and the TC-IM).
- Support digitalisation in metrology including the use of DCCs, digital twins, machine learning and similar issues.
- Engage with and disseminate knowledge and experience to stakeholders outside the TC-M community.