

Challenges in Mass and Related Quantities

2012-2013 TC-M Report to the General Assembly

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General

- Two dominant issues:
 - Redefinition of the kilogram
 - EMRP projects
- Last TC-M contact persons meeting –Cavtat, Croatia, 22 March 2012.
 - Technical sessions before the TC-CP meeting: mass, pressure, force and density
 - Including especial sessions for
 - EMRP projects (SIB 05, SIB 63)
 - Projects :1205 “EURAMET cg 18”, and 1210 “Best practice of the dissemination of the kilogram”

Projects

- 148 overall (four more than last year) concentrated for
 - mass and pressure
 - comparisons and research
- Only two new key comparisons proposed (mass)
- Five new supplementary comparisons (mass, force, pressure, density)

CMCs

4 new submissions or revisions from other RMOs reviewed

Submission	NMI	Field	CMCs	State
EURAMET.M.23.2011	IMBIH, Bosnia and Herzegovina	mass	new	published
EURAMET.M.26.2012	CMI, Czech Republic	force	review	published
EURAMET.M.30.2012	DPM, Albania	mass	new	published
EURAMET.M.31.2013	PTB, Germany	pressure	new	published
EURAMET.M.32.2013	BoM, Macedonia	mass	new	under review

EMRP 2010

Number	Short Name	Full Name
IND 03	HIGHpress	High Pressure Metrology for Industrial Applications
IND 09	Dynamic	Traceable Dynamic Measurement of Mechanical Quantities
IND 12	Vacuum	Vacuum metrology for production environments

High Pressure Metrology for Industrial Applications

SCOPE: Pressures up to 1.5 GPa are used in high-pressure technologies in general engineering, automotive, petrochemical, pharmaceutical and food industries.

GOAL: Traceability up to 1.6 GPa with a relative expanded uncertainty as low as 0.05 %.

PARTNERS: PTB, CMI, EJPD, LNE, SMU, TUC.



EMRP 2011

Number	Short Name	Full Name
SIB03	KNOW	Realisation of the awaited definition of the kilogram - resolving the discrepancies
SIB05	NewKILO	Developing a practical means of disseminating the new kilogram

Realisation of the awaited definition of the kilogram - resolving the discrepancies

SCOPE: A significant international effort is under way to establish a new definition of the kilogram based on the Planck constant h . These experiments have been completed (watt-balance and Si-sphere Avogadro), but the results show discrepancies.

GOAL: Resolving the existing discrepancies with relative standard uncertainties not larger than 5×10^{-8}

PARTNERS: PTB, INRIM, NPL, CNAM, NIST, NCR, EJPD.



Developing a practical means of disseminating the new kilogram

SCOPE: Practical experiments for the new definition of the kilogram cannot be performed as frequently as desired. In the new definition the kilogram will have an uncertainty, the traceability chain has to be improved to avoid affecting uncertainties provided to the user.

GOAL: Ensuring the continuity of the practical realisation of the mass unit between existing and new realisations of the kilogram.

Dissemination at the level of the NMIs must be achievable with relative uncertainty $< 2 \times 10^{-8}$.

PARTNERS: NPL, CMI, DFM, EJPD, LNE, PTB, MIKES, CNAM, MHEST, UME, INRIM, NCR

EMRP 2012

Number	Short Name	Full Name
SIB63	Force Metrology	Force traceability within the meganewton range

Force traceability within the meganewton range



SCOPE: This project addresses the increasing demand for traceability in the MN force range in European industry, in civil engineering, materials testing, wind power systems, off-shore industry, aviation industry and aerospace.

GOAL: Extending primary force standards up to 50 MN, developing new transducer principles, investigating the effects of influencing quantities and providing new procedures.



PARTNERS: PTB, BAM, NPL, CEM, CMI, EJPD, LNE, MG, MIKES, UME, INRIM

The End

Thank you for your attention