



**The 14th meeting of the CCM
21-22 February 2013 at the BIPM**



APMP TCM Activity Report 2012

APMP Chair of TCM: Tokihiko Kobata (NMIJ/AIST)

Activities in APMP TCM



- TCM : Technical Committee for Mass and Related Quantities
 - Mass, Force, Torque, Pressure, Vacuum, Density, Hardness, Gravity, ...
- Activities in TCM
 - Periodic meetings and workshops.
 - Linkage of APMP activities to CCM of the CIPM and to TCM in other RMOs.
 - Management and cooperation of APMP key, supplementary, and pilot comparisons.
 - Cooperation in building and claiming Calibration and Measurement Capabilities (CMCs) of member economies in APMP

TCM chair change



- Dr. Sam-Yong Woo, KRISS
– until Nov. 2012



- Dr. Tokihiko Kobata, NMIJ/AIST
– from Dec. 2012

TCM main ongoing comparisons (1/2)

- Mass:
 - Pilot study on National prototype of kilogram
 - piloted by KRISS and co-piloted by NMC, A*STAR. They have already circulated the transfer prototype. Participants (10): KRISS, SCL, NIM, NMIT, NMIJ, CMS, A*STAR, NMIA, NPLI, KIM-LIPI. Report in progress.
- Pressure:
 - Absolute pressure comparison (10 kPa-110 kPa), [APMP.M.P-K9](#).
 - Precise digital pressure gauges are used as transfer standard. KRISS is pilot lab. Participants (17): KRISS, NML-SIRIM, KIM-LIPI, MSL, NIM, NIMT, NIS, NMC A*STAR, NMISA, NSCL, SCL, PTB, NPLI, VMI, NMIJ, CMS-ITRI, NMIA. Draft A report in progress.
 - Gauge pressure comparison (50 MPa-500 MPa), [APMP.M.P-K13](#)
 - Pressure balance is used as transfer standard. NMIJ is pilot lab. Participants (13): NMIJ, KRISS, NML-SIRIM, KIM-LIPI, NIM, NIMT, NIS, NMC A*STAR, NPLI, CMS-ITRI, NMIA, KazInMetr, NBSM. Measurement in progress.
 - Vacuum comparison (0.1 mPa-1 Pa), [APMP.M.P-K14](#)
 - Two sets of SRG are used as transfer standard. NMIJ is pilot lab. Participants (7): NMIJ, NMIA, NIM, CMS/ITRI, A*STAR, KRISS, NPLI. Protocol in preparation.

TCM main ongoing comparisons (2/2)

- Density:
 - Hydrometer Comparison, [APMP.M.D-K4](#)
 - Pilot lab is KRISS. Participants (12): KRISS, MSL, NIM, NMIT, NMIA, NMIJ, NMISA, NMLPHL, KIM-LIPI, NML-SIRIM, NPLI, VNIIM. Draft A report in progress.
- Force:
 - 50 kN and 100 kN force comparisons, [APMP.M.F-K2.a](#) and [APMP.M.F-K2.b](#)
 - Pilot lab is KRISS. Participants (14): KRISS, A*STAR, ITRI, KEBS, KIM-LIPI, NIMT, NIS, NMIJ, NMISA, NML-SIRIM, NPLI, SCL, VMI, NIM, Measurement in progress.
 - 0.5 MN and 1 MN force comparisons, [APMP.M.F-K3.a](#) and [APMP.M.F-K3.b](#)
 - Pilot lab is NIM. Participants (7): NIM, A*STAR, KIM-LIPI, NIMT, NMIA, NMIJ, NPLI. Protocol in progress.
 - 2 MN force comparison, [APMP.M.F-K4.b](#)
 - Pilot lab is NMIJ. Participants (7): A*STAR, CMS, NIST, NMIA, KRISS, SCL, NMIJ. Approved for Equivalence and published.

TCM newly proposed comparisons

- Mass comparison:
 - APMP.M.M-K5 (200 mg, 1 g, 50 g, 200 g and 2 kg)
- Vacuum comparison
 - APMP.M.P-K4 (1 Pa to 10 kPa) piloted by KRISS, Link Lab. NMIJ
- Torque Project :
 - Pilot study, 1 kNm, organized by KRISS,
 - supported by APMP TC Initiative 2012
- Hydraulic Pressure Project:
 - organized by NIMT, Follow-up project to finish last DEC 100 MPa pressure comparison exercise
 - supported by APMP DEC

Candidates of TCM key comparison

- 50 kg comparison: requested by NIM, proposed for discussion
- AFM cantilever stiffness comparison requested by CMS-ITRI
- Brinell Hardness and Vickers Hardness proposed by NPLI
- Differential pressure requested by NMC/A*STAR, 1 Pa -10 kPa (line pressure: absolute about 100 kPa)
- Hydraulic pressure 0.1 MPa - 10 MPa requested by NIM

Peer Review Status

- NMIA, Australia (Mass/Force/Density/Pressure and Vacuum), 2012
- MSL, New Zealand (Pressure and Vacuum), 2012
- KRISS, Korea (Mass/Force/Density/Pressure and Vacuum), 2012
- MUSSD, Sri Lanka (Mass), 2012
- NMIJ, Japan (Mass/Force/Torque), 2012

TCM Associated Workshop and Related Conference (1/2)

- Asia-Pacific Symposium on Measurement of Mass, Force and Torque (APMF) 2011, Xi'an, China (19-22 September 2011)
 - hosted by NIM, China.



- XX IMEKO World Congress, Busan, Korea (9-14, Sep. 2012)
 - hosted by KRISS, Republic of Korea
 - Fields related to TCM are TC3 (Force, Mass & Torque), TC16 (Pressure and Vacuum), TC5 (hardness)



TCM Associated Workshop and Related Conference (2/2)

- 6th APMP Pressure and Vacuum Workshop, Wellington, New Zealand (23-24 Nov. 2012)
 - Hosted by MSL, New Zealand

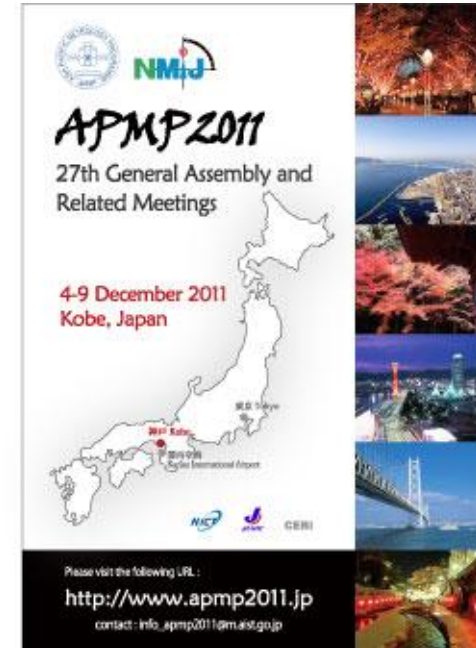


APMP TCM meetings held since last CCM

- The 12th Meeting of APMP-TCM
 - 5-6 December 2011 Kobe, Japan Hosted by NMIJ, Japan



APMP2011総会の様子



- The 13th Meeting of APMP-TCM
 - 26-27 November 2012 Wellington, New Zealand Hosted by MSL, New Zealand



Photo of APMP 2012 TCM



APMP TCM meeting planned

- The 14th Meeting of APMP-TCM
 - 24-25 November 2013 Taipei, Taiwan Hosted by CMS/ITRI, Taiwan





End of Report

Thank you for your attention!