

20. May 2009

1. General Aspects

One general finding is the increasing workload mainly caused by the growing numbers of new EURAMET members and high demands for the MRA work. Moreover many members of TC-L are very active regarding the EMRP Targeted Programme 3 (Length).

2. Projects

Some statistics: In the period under review there were a total of 33 active projects (16 comparisons, 3 consultation, 9 research, 5 traceability) in TC-Length. 12 of them are running already under EURAMET with project number 1000 upwards.

3. Comparisons

The current status of key and supplementary comparisons in length is shown in the following compilation.

The first and only round of CCL comparisons is now virtually completed. The effective CCL key comparison portfolio looks like this:

- K1 Gauge blocks up to 500 mm (including also former CCL-K2)
- K3 Angle standards (polygons and angle blocks)
- K4 Cylindrical diameter standards
- K5 Step gauge
- K7 Line scales
- K8 Surface texture standards
- K11 National standards of length (optical frequency/wavelength standards, former BIPM.L-K11)

CCL-K11 will continue the work of BIPM.L-K11 which has stopped because of closing the BIPM length section. Out of the 5 so called node laboratories running CCL-K11, 3 are members of EURAMET (MIKES, NPL and BEV [being the pilot]).

EURAMET has either completed or is to complete a range of RMO key comparisons, aligned with the CCL-KC. K1 and K2 are fully completed and reported, Measurements of K4, K5 and K6 (2D-CMM) are completed and draft A report was circulated (with the exception of one of the two rounds in K4), and K7 is still running waiting for results of a non-EURAMET NMI. K4, K5 and K7 are all RMO key comparisons (piloted by EURAMET) with participation from other RMOs NMIs. At the last TC-L meeting it was decided to start an EURAMET comparison in line with CCL-K3 (angle) using an autocollimator as artefact. Extensive investigations on the suitability and stability on this type of instrument have been performed by the pilot PTB in reaction on concerns by other RMOs.

Designation	Subject	Project no.	Report/status
EUROMET.L-K1	Gauge blocks	471	Final report Executive Report
EUROMET.L-K1.1	Gauge blocks	643	Final report
EUROMET.L-K2	Long gauge blocks/length bars	602	Metrologia paper Executive Report
EUROMET.L-K3a.2009	Angle comparison using an autocollimator	1074	started
EUROMET.L-K4.2005	Diameter	812	Draft A for one round circulated
EUROMET.L-K5.2004	1D CMM artefacts	777	Draft A circulated
EUROMET.L-K6	2D CMM artefacts	743	Draft A circulated
EUROMET.L-K7.2006	Linescales (up to 100 mm)	882	Running
SIM-EURAMET.L-K8	Roughness comparison	1003	started

EURAMET supplementary comparisons (EURAMET.L-Sx): In the following table one can find details on previous and new comparisons organized and reviewed by TC-L as being suitable for supporting the MRA.

Designation	Subject	Project no.	Report/status
EUROMET.L-S1	Linescales	252	BNM/LNE, 1995
EUROMET.L-S2	Thermal expansion of gauge blocks	275	Metrologia paper Final report
EUROMET.L-S3	Depth setting standards	301	Metrologia paper
EUROMET.L-S4	Wires (diameter)	308	Metrologia paper
EUROMET.L-S5a	Roundness	BCR	Metrologia paper
EUROMET.L-S5b	Roundness	361	Metrologia paper
EUROMET.L-S6	Thermal expansion of long gauge blocks	390	PTB Report
EUROMET.L-S7	Surface plates	BCR	EUR 14059 EN, 1992
EUROMET.L-S8	Nd YAG lasers	Bilateral	Metrologia paper
EUROMET.L-S9	Grid plates	BCR 3442	3442/1/0/189/91/7
EUROMET.L-S10	Squares	570	Metrologia paper Executive Report
EUROMET.L-S11	Surface texture	600	Metrologia paper Final report
EUROMET.L-S12	Gauge blocks by comparison	601	Final Report
EUROMET.L-S13	Cylindrical artefacts	369	Final Report (PTB)
EUROMET.L-S14	Steel tapes	677	Final Report Executive Report
EUROMET.L-S15	Step heights by SPM	707	Final Report
EUROMET.L-S16	Gauge blocks by comparison	797	Final Report
EUROMET.L-S17	Steel tape, trilateral (link to S14)	875	Final Report
EUROMET.L-S18	Granite square, bilateral (link to S10)	905	Draft A circulated
EUROMET.L-S19	Steel cylindrical square, bilateral (link to S10)	910	waiting for report
EURAMET.L-S15a	Intercomparison of Measurements on Step Height Standards by SPM	925	started

4. CMCs

The seventh set of length and angle CMCs, EUROMET.L.6.2008, was approved and entered the KCDB in January 2009. The next set of CMCs, EURAMET.L.7.2009 is now under intra-RMO review.

Designation	Comment	Status
EUROMET.L.1.2000	Initial top level service submission from most of EUROMET NMIs.	Complete - on KCDB, 2001
EUROMET.L.1.2001	Full submission, almost all services, most EUROMET NMIs, update on .L.1.2000 .	Complete - on KCDB, 2001-10-30
EUROMET.L.2.2002	Minor updates/submissions from GB and FI.	Complete - on KCDB, 2003-01-09
EUROMET.L.3.2004	Submissions from AT, CH, CZ, DE, HU, IT, NO. Also first submission from BG, LT, LV, RO, SI, YU.	Complete - on KCDB, 2005-03-23
EUROMET.L.4.2006	24 minor updates and 35 new submissions.	Complete - on KCDB, 2006-05-10
EUROMET.L.5.2007	19 updated or new CMCs from 7 NMIs	Complete - on KCDB, 2007-05-21
EURAMET.L.6.2008	37 CMCs (new and updated) from 8 countries including EG	Complete - on KCDB, 2009-02-11
EURAMET.L.7.2009	33 CMCs (new and updated) from 8 countries	under EURAMET review

From other RMOs, 7 sets of CMCs were added and had already undergone the inter-RMO review.

Designation	Comment	EURAMET review date	Status
SADCMET.L.1.2001	First main submission from SADCMET.	N/A	Abandoned
COOMET.L.1.2002	First main submission from COOMET. Re-examined in early 2004.	Oct 02 - Dec 03 and Jan-Mar 04	Complete - on KCDB, 2004-04-06
APMP.L.1.2003	MY, TW submissions. Reviewed by EUROMET TCL Chairman.	Nov 03 - Dec 03	Complete - on KCDB, 2004-02-19
SIM.L.1.2003	Major submission from NIST. Reviewed by EUROMET TCL Chairman.	Sep 03 - Nov 03	Complete - on KCDB, 2004-01-15
SIM.L.2.2003	Submissions from BR, MX, USA.	Dec 03 - Feb 04	Complete - on KCDB, 2004-06-15
COOMET.L.2.2004	Second main submission from COOMET. Ukraine. (Belarus temporarily removed).	Jan 04 - Apr 04	Complete - on KCDB, 2005-01-10
APMP.L.2.2004	Major submission from JP. Review by EUROMET TCL Chairman.	May 04 - May 04 and Mar 05	Complete - on KCDB, 2005-05-25
COOMET.L.3.2005	Next main submission from COOMET. Belarus (was part of COOMET.L.2.2004).	Mar 05	Complete - on KCDB, 2005-06-17
APMP.L.3.2006	23 new CMCs from NPL – India	Feb 06	Complete - on KCDB, 2007-01-08
APMP.L.4.2006	3 new CMCs from Indonesia	Aug 06 – Dec 06	Complete - on KCDB, 2008-05-16
APMP.L.5.2008	CMCs from CMS – Chinese Taipei	May 08	Complete - on KCDB, 2008-12-15
APMP.L.6.2008	CMCs from SCL – Hong Kong	Apr 08	Complete - on KCDB, 2008-06-26
APMP.L.7.2008	CMCs from NMIJ – Japan	Nov 08	Complete - on KCDB, 2008-04-16
APMP.L.8.2009	CMCs from NMIJ – Japan	Feb 09	Complete - on KCDB, 2008-03-24
APMP.L.9.2009	CMCs from SCL – Hong Kong	Feb 09	Complete, waiting for AFRIMETS
SIM.L.3.2007	CMC Changes from INMS – Canada	Jun 07	Complete - on KCDB, 2007-08-08
SIM.L.4.2007	CMC Changes from INMS – Canada	Dec 07	Complete - on KCDB, 2008-03-25

It was agreed by EURAMET and the JCRB that CMC claims of NIS (Egypt) and of INPL (Israel) will be handled by EURAMET since they are not member of any RMO up to now. In the field of length, the CMCs of NIS (regarding *mise en pratique* laser radiation) are already published in the KCDB via EURAMET.L.6.2008. An on site peer visit (and review) for INPL took place end of January 2009. Some open points have to be clarified and will be discussed within TC-L. For the time being the CMCs of INPL have not been included into the current EURAMET.L.7.2009.

5. Activities of the Sub-Committees

There are no sub-committees in TC-L.

6. Participation in iMERA-Plus

Obviously TC-L is responsible for the targeted programme in length (TP3). Four Joint research programs (JRP) are funded by the European Commission:

JRP	JRP Short name	JRP Title
J1.1	Nanoparticles	Traceable characterization of nanoparticles
J1.4	NANOTRACE	New Traceability Routes for Nanometrology

J3.1	Long distance	Absolute long distance measurement in air
J2.2	NIMTech	Metrology for New Industrial Measurement Technologies

All of them started their work last year and a number of meetings have been held (see item 7).

The first call for the subsequent FP7 “Energy” is not so important for TC-L, only one proposal was defined up to now.

7. Meetings

Previous meetings

- 2008 TC-L CP Meeting, 6-7 October 2008, MIKES, Espoo, Finland
- 2008 TC-L Workshop on “Recent developments in Length Laboratories”, 7 October 2008, MIKES, Espoo, Finland
- 13th Meeting of the CCL-WGDM: 24-25 September 2008, INRIM, Torino, Italy
- J1.1 Meeting (Nanoparticles), 2-3 June 2008, NPL, Teddington, UK
- J1.4 Meeting (NANOTRACE), 14-15 April 2008, INRIM, Torino, Italy
- J3.1 Meeting (Long distance), 19-10 May 2008, CEM, Madrid, Spain
- J3.1 Meeting (Long distance), 24 October 2008, BEV, Vienna, Austria
- J2.2 Meeting (NIMTech), 13-14 March 2008, PTB, Braunschweig, Germany
- J2.2 Meeting (NIMTech), 4 November 2008, INRIM, Torino, Italy
- J3.1 Meeting (Long distance), 4-5 May 2009, MIKES, Espoo, Finland
- J2.2 Meeting (NIMTech), 11 May 2009, CMI, Prague, Czech Republic

upcoming meetings

- 2009 TC-L CP meeting, 19-21 October 2009, IPQ, Porto, Portugal
- Meeting of the CCL-CCTF, 2 June 2009, BIPM Sevres, France
- Meeting of the CCL-WGDM, 8-9 June 2009, BIPM Sevres, France
- 14th Meeting of the CCL, 10-11 June 2009, BIPM Sevres, France
- J2.2 Meeting (NIMTech), 6 November 2009, NPL, Teddington, UK
- J1.4 Meeting (NANOTRACE), 16-17 April 2009, NPL, Teddington, UK

8. Issues / Strategic planning / Outlook for 2009/2010

The issues identified as strategic have not been changed since the last report. Some minor adjustment were necessary because of input by other parties.

8.1 DimVIM

The DimVIM (CCL Length Services Classification) used as a CMC classification scheme is now available in 13 languages on the EURAMET Length web site (Greek was added in 2008). Because of its importance it is directly linked from the BIPM site. In the near future there will be an update by the WGDM regarding CMC for fs comb calibrations.

8.2 CIPM concerns on CCL-RMO KC

The concerns raised by the CIPM at its 2006 meeting with respect to the way, how CCL is operating and linking its comparisons came as a surprise to CCL. WGDM recognized the importance of the issues raised. At its 13th meeting it was decided that a task force will prepare a paper ready for the next CIPM. Because of the great number of NMIs which are members of both, EURAMET and CCL, the outcome will be of vital importance for EURAMET TC-L.

8.3 Long time storage on comparison data

TC-L has concerns about the long term storage of key comparison data in the raw, original format. At the moment only the pilots have the original data available and in the case that the pilot left the NMI or was no longer contactable, the data would be difficult to obtain without major effort amongst the participants. Moreover It can be foreseen that ILAC would make requirements on those who conduct comparisons (like safe storage of protocol, raw results, etc.) At the 2008 TC-L meeting a definitive of data to be archived was concluded to consist of:

- Protocol

- Folder with individual laboratory results (*optional*)
- Spreadsheet with all results and analysis (*optional*)
- Final Report
- Executive report (*optional*)

The archiving of Draft A was abandoned. Similar action might be useful for the CCL also.

8.4 Issues related to CCL-K11

Since 3 out of 5 node laboratories are members of EURAMET, it is quite important for TC-L to provide a sound basis on running this key comparison. One step is how to share responsibilities between CCL and CCTF. The CCL-CCTF joint working group on frequency standards will take responsibility for CCL-K11 while WGDM specifically will coordinate CMC review for comb based frequency calibrations. In the period reported the technical protocol for CCL-K11 has been updated and two rounds of measurements have been performed already (both within EURAMET).

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TC-Length Chairman, 20 May 2009