



Annual report EUROMET TC Length, 2002/2003

1 General aspects

1.1 Summary of activities

This year, apart from the numerous active, running projects again a number of new projects have been proposed or started, in particular two supplementary comparisons and some small co-operations in research. The review of CMCs has reached its steady state, i.e. the submissions of a few new CMCs, some amendments and CMC submissions from new member countries. A TC meeting, a workshop and a common FP6 proposal for a network of excellence in Nanometrology can be reported.

1.2 Interregional contacts

There were no particular interregional contacts apart from those taken place at the meetings of the CCL working group on dimensional metrology and some correspondence in the context of key comparison reports.

1.3 Web site and Length bulletin

The EUROMET Length web site (<http://www.npl.co.uk/euromet/length>), hosted at NPL and maintained by Andrew Lewis (NPL) still proves to be a very useful source of information. This year a new Length bulletin has been edited by Gerard Kotte (NMI-VSL). It contains general contributions, reports on EUROMET projects and the points of contact. It can be downloaded from <http://www.npl.co.uk/euromet/length/bulletin.html>.

1.4 EUROMET initiative on Nanometrology, NANOMET for FP6

The goal of the *EUROMET initiative on Nanometrology* is to strengthen the collaboration of EUROMET NMIs in the field of dimensional metrology related to the needs of nanotechnology. Under the leadership of PTB, the group has sent an expression of interest for FP6 and, following the call, submitted a proposal for a *Network of Excellence on Nanometrology and Positioning* (NANOMET). The scope of this network would be focussed on the rather limited field of metrology and manipulation at molecular or atomic dimensions. It involves about 10 EUROMET NMIs, forming the backbone of the network, and a number of other institutes and industries. The *EUROMET initiative on Nanometrology* will continue to exist, since it covers a much wider field. Its terms of reference will have to be redefined once it is clear whether NANOMET has been retained from FP6.

2 Meetings

The annual TC meeting was held in Maribor, Slovenia on October 14-15, 2002, organised by Bojan Acko, MIRS, University of Maribor. It was attended by 27 participants from 26 countries and the BIPM. The status of all active projects was reviewed. From four active and three completed projects intermediate or final reports were presented.

Further topics at the meeting were the participation and contribution of EUROMET to the MRA key comparisons, the review of the CMCs of new countries, the updating process of the EUROMET CMCs, and difficult questions around KC reference values, in particular the treatment of unstable artefacts and the linkage between CIPM and RMO comparison refer-

ence values. Directly after the meeting, a one-day workshop on *Recent technical developments at length laboratories* was held with the participation of all contact persons.

The next contact persons meeting will be held on October 13-14, 2003, in Dublin, Ireland, most probably again in conjunction with a workshop.

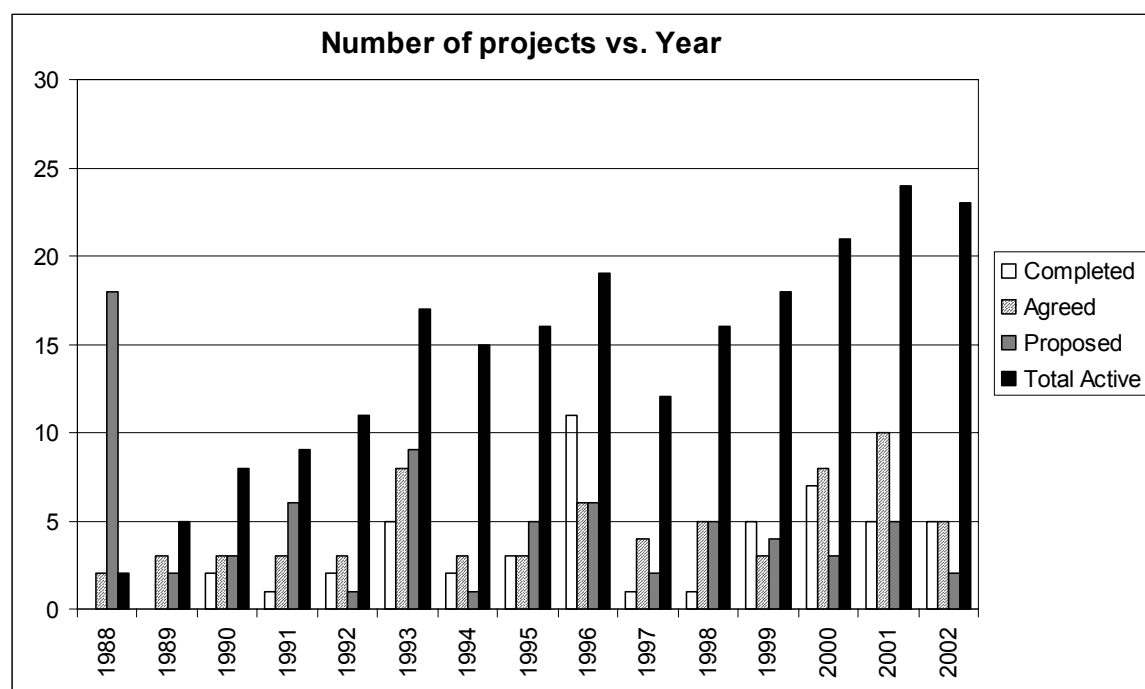
3 Projects

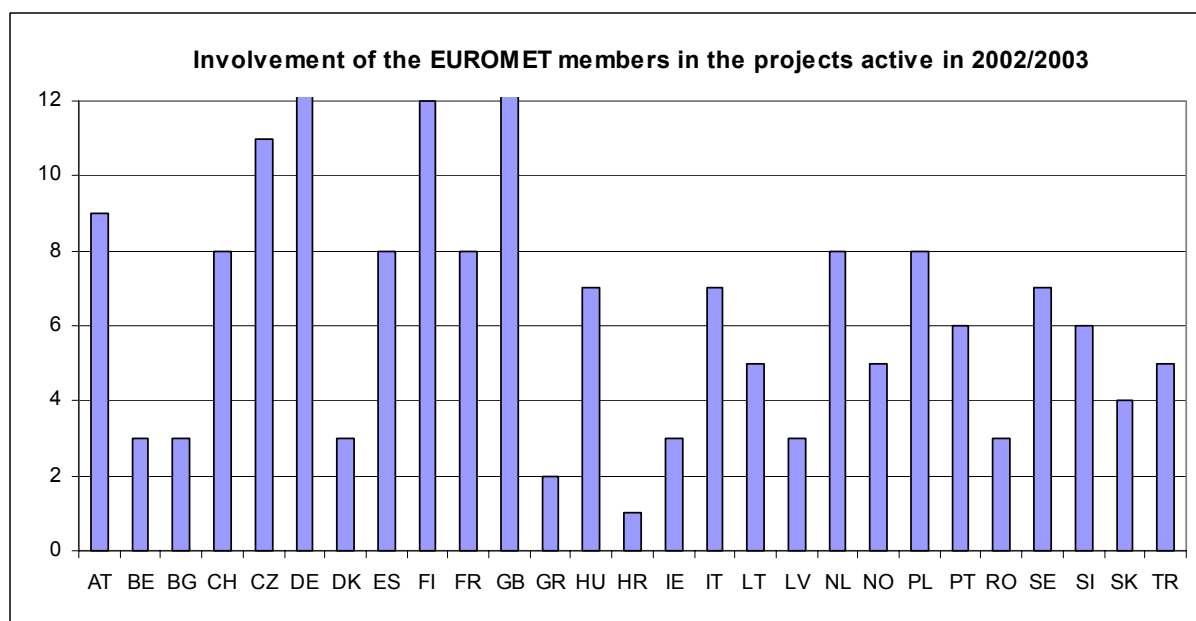
For the following, all information is adjourned on the 1 April 2003 on the basis of the actual status of the active projects as recorded by TC Length.

In the reporting period, 25 projects involving 171 participations from EUROMET NMIs and corresponding members were active. Four of these projects are on-going traceability agreements, one consultation, twelve co-operations in research and eight comparisons. Five projects have been completed while seven new projects were proposed and mostly agreed during this period. One project has been deleted.

Eight of the projects are related to the MRA: three active projects are EUROMET key comparisons and five projects are supplementary comparisons.

Active projects in 2001		Project No.	Type of Co-operation
On-going:	4	7, 135, 137, 142	traceability agreements
Current:	21 (+1)	471, 570, 588, 600, 601, 602, 610, 630, 639, 640, 643, 647, 649, 652, 654, 659, 672, 677, 678, 679, 698	1 consultations 12 co-operations in research 8 comparisons
Total active:	25 (+1)		





4 Mutual Recognition Arrangement

4.1 CIPM Key Comparisons

KC	Pilot	Status	EUROMET participants	EUROMET meas. date
CCL-K1	CH	completed	CH GB FR	1999
CCL-K2	GB	completed	GB IT DE	1999
CCL-K3	ZA	draft A expected	FR IT CH DE	2001
CCL-K4	USA	draft A expected	CH DE GB IT	2000/2001
CCL-K5	DE	draft A expected	ES IT CH DE	2000/2001
CCL-K6	MX	running	FR CZ NL GB DE	2001/2002

4.2 EUROMET Key Comparisons

KC	Pilot	Project #	Status	No. of part.	Meas. date
EUROMET.L-K1	FR	471	completed	17	1999/2000
EUROMET.L-K1bis	NO	643	running	6	2002
EUROMET.L-K2	GB	602	running	23	2002/2003
EUROMET.L-K3	DE	371	completed	13	1996 - 1999
EUROMET.L-K4	CH	384	completed	15	1996 - 1998
EUROMET.L-K5	DE	372	completed	7	1996 - 1998
EUROMET.L-K6	DE	-	proposed	(13)	not yet defined

4.3 EUROMET Supplementary Comparisons

A list of past comparisons has been entered in the BIPM key comparison database. Only the actually running supplementary comparisons are listed below.

SC, subject	Pilot	Project #	Status	No. of part.	Meas. date
EUROMET.L-S10, Squareness	SK	570	measurements completed	10	2000 - 2002
EUROMET.L-S11, Surface texture	DE	600	measurements completed	15	2001/2002
EUROMET.L-S12, Gauge blocks by comparison	IE	601	measurements completed	11	2001/2002
EUROMET.L-S14, Steel tapes	CH	677	running	17	2003/2004

4.4 CMCs

- All EUROMET Length CMCs have been reviewed by the EUROMET review committee and were accepted after the inter-regional review by the other RMOs. Meanwhile they are published on the KCDB.
- Interregional review of COOMET CMCs by EUROMET: still waiting for reply on open questions (documented on JCRB review log book).
- 3rd EUROMET submission in preparation, containing withdrawals, amendments, new CMCs and CMCs from new countries (Lithuania, Bulgaria, Yugoslavia); deadline: 31 March 2003.

Overview on the project activities of EUROMET TC Length

#	Subject	Type	Partners	Status
7	Calibration of gear standards	Trac	DE GB	ongoing
135	Calibration service for line standards from 0 to 3000 mm	Trac	FR GB	ongoing
137	Certification of API gauges	Trac	GB DE FR	ongoing, latest progress report Aug.2000
142	Calibration of polarimeters & saccharimeters	Trac	DE GB	ongoing
471	Short gauge blocks measured by interferometry	Comp	FR AT BE CH CZ DE DK ES FI GB HU IT NL NO PT SE SK	measurements completed Sep 2000, draft A report received Sep 01
570	Comparison of squareness standards	Comp	SK CH CZ DE FI FR HU NL PL PT SE SI	Comparison measurements completed
588	Traceability of surveying and geodetic instruments	Coop	ES	Final report Sep 02
600	Comparison of surface texture standards	Comp	DE AT CH CZ DK ES FI GB IT NL PL PT SE SK TR	Comparison measurements completed
601	Mechanical comparison of gauge blocks	Comp	IE AT CZ FI GB GR HU NO PL SI TR	Comparison measurements completed
602	Calibration of long gauge blocks, EUROMET.L-K2	Comp	GB AT BE BG CH CZ DE ES FI FR HU IE IT LT LV NL PL PT RO SE SI SK TR	First circulation completed; 2 gauge blocks to be replaced due to damage
610	Comparison of reference laser interferometer systems	Coop	CZ AT HU NO	First measurement series completed
630	EUROMET Initiative on Nanometrology	Coop	CH CZ DE DK ES FI FR GB IT NL PL PT SE SI TR	Progress report Oct 02
639	Mechanical calibration of gauge blocks	Coop	FI LT LV SE EE	Final report received Nov 02
640	Error separation algorithms in high precision roundness	Coop	FI GB	Proposed Oct 2001, cancelled Jan 03
643	Short gauge blocks measured by interferometry	Comp	CZ, DE, FI, GR, NO, PL, PT, RO, TR, BG	Meas. expected to be completed May 03
647	Investigation of techniques for absolute laser frequency measurements using an optical femtosecond comb laser	Coop	AT CZ	Progress report Oct 02
649	Sensitivity transfer standards for form measuring instruments	Coop	DE CH FI FR GB IT NL	Proposed Feb 2002
652	Calibration of short steel gauge blocks by mechanical comparison	Coop	SI AT HU HR	Final report received Dec 02
654	Exchange of experience in gauge blocks and material measures of length measurements	Cons	PL IE	Final report received May 02
659	The combination of scanning probe microscopy, optical interferometry and x-ray interferometry	Coop	GB DE	Agreed Apr 02
672	Determination of form/topography of high-quality flats	Coop	DE ES FI FR GB IT NL	Proposed Aug 02
677	Comparison of steel tape measures	Comp	CH AT BE BG CZ DE ES FI HU LT LV NO PL RO SE SI AU	Comparison started Mar 03
678	Workshop on Recent technical developments at length laboratories	Coop	CH	Workshop held Oct 02
679	Calibration of ring and plug gauges	Coop	NL ES	Agreed Oct 02
707	Intercomparison of Measurements on Step Height Standards by SPM	Comp	DE CZ IT	Proposed Feb 03