

EUROMET TC Length

Chairman's Annual Report (2004/2005)

EUROMET General Assembly
Varna, Bulgaria, 25-27 May 2005

Andrew Lewis, NPL

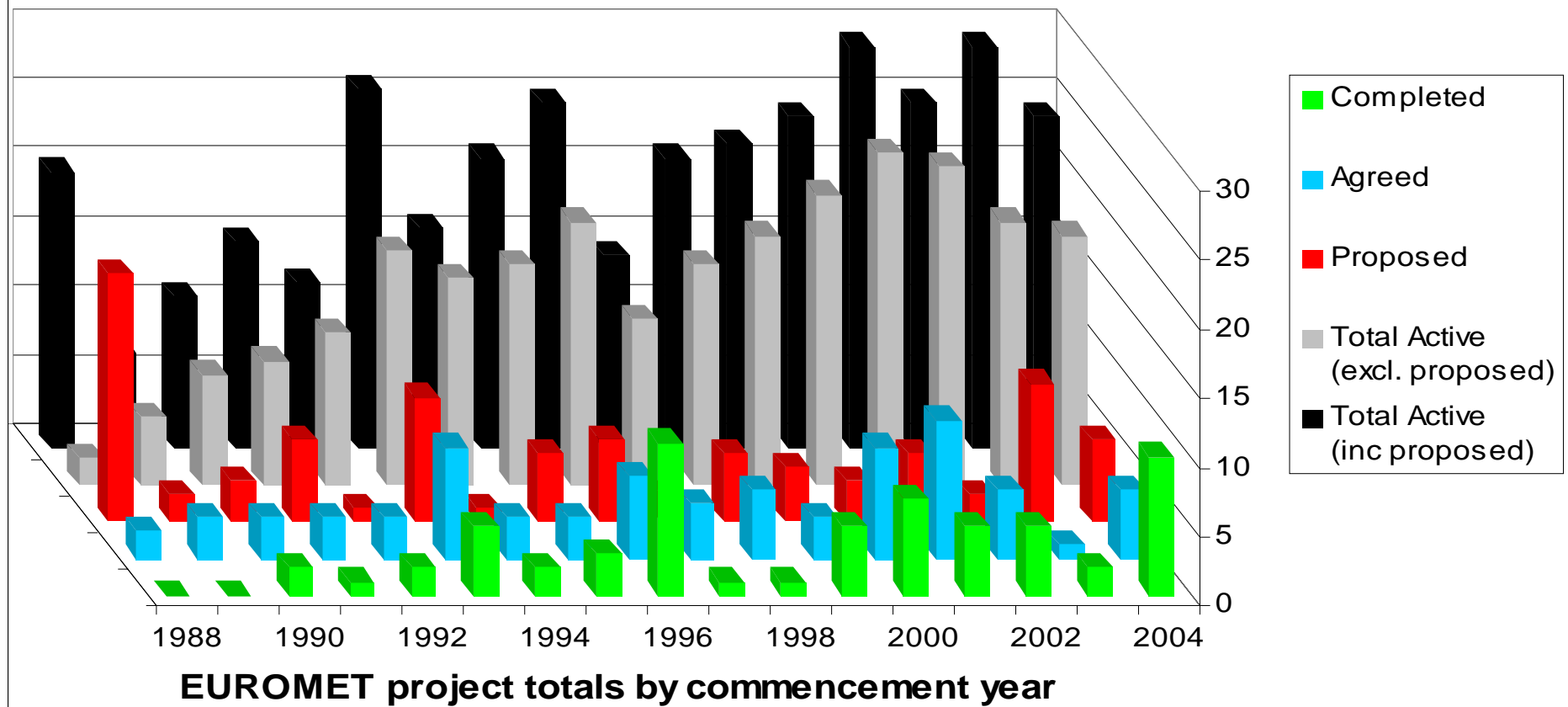


- Project statistics (numbers, participation, coordination)
- Status of key comparisons: CCL and EUROMET
- New style of CCL-RMO key comparison - example
- Status of length CMC submissions
- EA guidelines
- Meetings
- Other issues in TC-Length
- Some interesting science



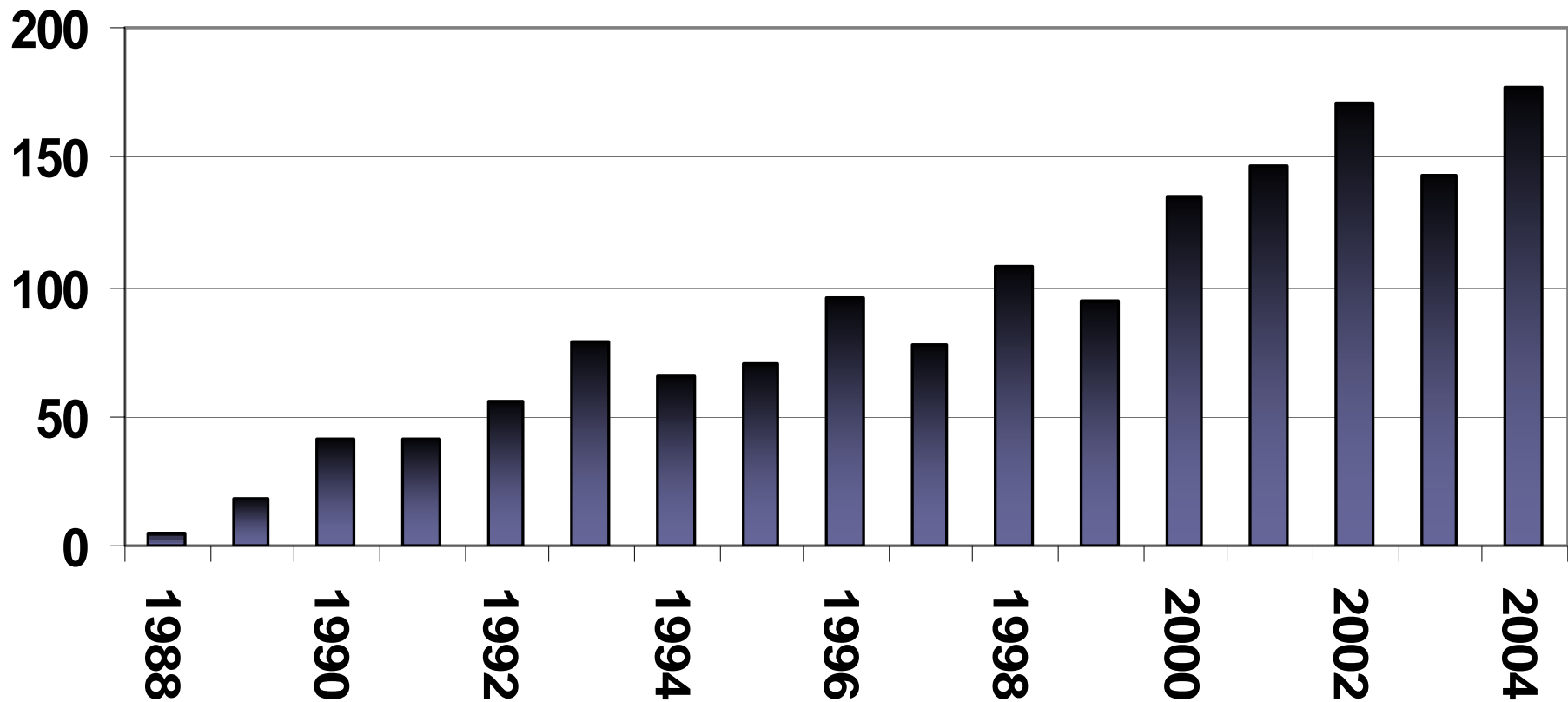
Project statistics: 2004-2005

10 completed, 5 agreed, 6 proposed, 24 total active





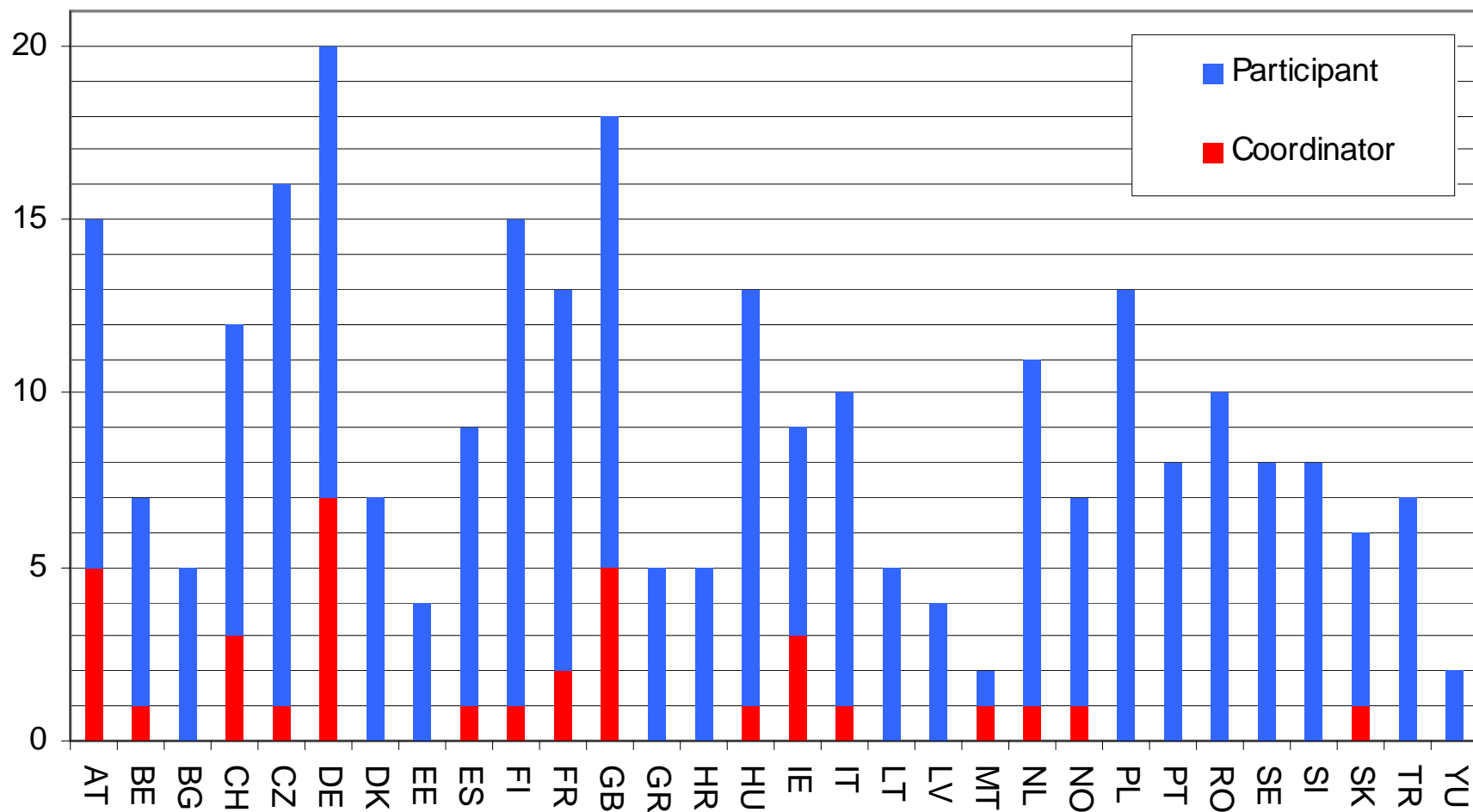
TCL Projects: total participation by commencement year





Participation in TCL projects during 2004/05

Project participation by NMI





KC	Topic	Pilot	Status	EUROMET participants	EUROMET meas. date	Report
CCL-K1	Gauge blocks	CH	Complete	CH, GB, FR	1999	Final (Metrologia)
CCL-K2	Long gauge blocks	GB	Complete	GB, IT, DE	1999	Final (Metrologia)
CCL-K3	Angle	ZA	Draft A seen	FR, IT, CH, DE	2001	-
CCL-K4	Diameter	US	Draft B2 seen	CH, DE, GB, IT	2000/2001	Draft - B2
CCL-K5	1-D CMM artefacts	DE	Draft B4a seen	ES, IT, CH, DE	2000/2001	Draft - B4a
CCL-K6	2-D CMM artefacts	MX	Measurements complete	FR, CZ, NL, GB, DE	2001/2002	-



Study	Topic	Pilot	Status	EUROMET participants	EUROMET meas. date	Report
NANO1	Linewidth	US	Planning	DE, DK, IT, NL, PL, GB, FR	-	-
NANO 2 (CCL-S2)	Step height	DE	Complete	DE, ES, CH, DK, PL, IT, NL, GB,	2000/2001	Final
NANO 3 (CCL-S3)	Linescales (<300 mm)	DE	Complete	DE, CH, FI, SE, IT, FR,	2000	Final
NANO 4 (CCL-S1)	1-D gratings	CH	Complete	CH, DK, DE, IT, GB	1999	Final
NANO 5	2-D grids	DK	Running	DK, CH, DE, GB, IT, NL, CZ, FI	2005	-



KC	Topic	Pilot	No.	Status, report	Meas. date	Comments
EUROMET.L-K1	Gauge blocks	FR	471	Final	1999-2002	Supersedes L.K1.PREV
EUROMET.L-K1(a)	Gauge blocks	NO	643	Draft – B2	2002	Subsequent to L-K1
EUROMET.L-K2	Long gauge blocks	GB	602	Running	2002-2005	Supersedes L.K2.PREV
EUROMET.L-K3.PREV	Angle	DE	371	Completed before MRA	1996-1999	L.K3.2006 to be planned
EUROMET.L-K4.PREV	Diameter	CH	384	Completed before MRA	1996-1998	L.K4.2005 detail planning
EUROMET.L-K5.2004	1-D CMM	DE	777	Running	2004-2005	Supersedes K5.PREV
EUROMET.L-K6	2-D CMM	DE	743	Running	2004-2005	First round KC



New style of key comparisons: 'CCL-RMO key comparison'

- Approved by CCL
- Run by the RMOs
- Expect and require inter-RMO participation
- EUROMET.L-K5.2004 (step gauges) – CEM (ES) pilot
- Discussed, coordinated and approved by CCL-WGDM
- 5 non EUROMET participants (19 total)
- Running!

Year	1999	2000	2002	2003	2004	2005	2006	2007	2008	2009
	CCL K5:1									
EUROMET	PTB						PTB	Germany		
	CEM					CEM	Spain			
	METAS						METAS	Switzerland		
	IMGC				IMGC	Italy				
					BNM	France				
					BEV	Austria				
					NGM	Denmark				
					NMi-VSL	Netherlands				
					MIKES	Finland				
					SP	Sweden				
SIM					NPL	UK				
					NML	Ireland				
					CMI	Czech Republic				
					GUM	Poland				
					OMH	Hungary				
					INM	Romania				
	CENAM					CENAM	Mexico			
					INMETRO	Brazil	INTI	Argentina		
	NIST					NIST	USA			
	NRC				NRC	Canada				
SADCMET	CSIR				CSIR	South Africa				
APMP	NMIA(csiro)				NMIA	Australia				
	NMIJ					NMIJ	Japan			
	KRISS					KRISS	Korea			
	NIM					NIM	China			
						SCL	Hong Kong			
						NPLI	India			
						KIM/LIPI	Indonesia			
						IRL/MSL	New Zealand			
						NMIT	Thailand			
						ITRI/MIRL	Taiwan			
COOMET	VNIIM				VNIIM	Russia				



New style of key comparisons: 'CCL-RMO key comparison'

- EUROMET.L-K5.2004 (step gauges) - running
- EUROMET.L-K4.2005 (diameter) – planning
 - 2 loops (uncertainty dependent)
 - 2 pilots ('IMGC' IT, 'OMH' HU)
- EUROMET.L-K3.2006 (angle) - thinking

EUROMET length CMC submissions



Designation	Comment	EUROMET review date	Status
EUROMET.L.1.2000	Initial top level service submission from most of EUROMET NMIs.	2000	Complete - on KCDB, 2001
EUROMET.L.1.2001	Full submission, almost all services, most EUROMET NMIs, update on .L.1.2000 .	2001	Complete - on KCDB, 2001-10-30
EUROMET.L.2.2002	Minor updates/submissions from GB and FI.	Jun 02	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.	Jul 03 - Jun 04	Complete - on KCDB, 2005-03-23
EUROMET.L.4.2005	24 Minor updates and 35 new submissions.	May 05 -	Undergoing EUROMET internal review



Other RMO length CMC submissions

Designation	Comment	EUROMET 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	Accepted, about to enter KCDB
COOMET.L.3.2005	Next main submission from COOMET. Belarus (was part of COOMET.L.2.2004).	Mar 05	Re-review, SIM, SADCMET (APMP, EUROMET accepted)



EA SPECIFIC CALIBRATION DOCUMENTS

REF. NO	TITLE	PUBLISHED	FILE	COUNTRIES USING	COMMENTS & RECOMMENDATION
EA-10/01 (rev.01)	Calibration of Stylus Instruments for Measuring Surface Roughness <i>(previously EAL-G20)</i>	AUG 1996	PDF (105KB)	SE, DE, BG, (LV)	<p>Revision necessary. Presently being revised within the framework of DKD (German calibration service). The result can serve as legwork.</p> <p>EN ISO 12179:2000 is an alternative therefore EA10/01 should be withdrawn.</p> <p>ALREADY BEING UPDATED, KEEP</p>
EA-10/02 (rev.02)	Calibration of Gauge Block Comparators <i>(previously EAL-G21)</i>	AUG 1996	PDF (76KB)	GB, CH, SE, DE, BG, (LV), PL, AT	<p>The EA-document is according to our estimate the most important, up-to-date guide line for accreditation of DKD-calibration laboratories. A revision is presently not necessary.</p> <p>Already translated into German.</p> <p>Could be updated to include longer range comparators.</p> <p>Minor review for details (k=3) ?</p> <p>KEEP. CONSIDER UPDATE</p>
EA-10/05 (rev.01)	Co-ordinate Measuring Machine Calibration <i>(previously EAL-G17)</i>	JAN 1995	PDF (148KB)	(CH), SE, BG, PL	<p>Out of date, we no longer work with it.</p> <p>Should be revised or withdrawn in favour of the ISO TR series 15530.</p> <p>WITHDRAW</p>



EA SPECIFIC CALIBRATION DOCUMENTS

REF. NO	TITLE	PUBLISHED	FILE	COUNTRIES USING	COMMENTS & RECOMMENDATION
EA-10/06 (rev.01)	Extent of Calibration for Cylindrical Diameter Standards (<i>previously EAL-G29</i>)	JUNE 1997	PDF (31KB)	(GB), CH, SE, DE, BG, (LV), PL, AT	<p>The document fulfils the present requirements. In Germany it is used as basis for accreditations.</p> <p>Translated to German.</p> <p>Partial conflict with BS 4064 measurement strategy.</p> <p>KEEP</p>
EA-10/10 (rev.00)	Determination of Pitch Diameter of Parallel Thread Gauges by Mechanical Probing	APR 1999	PDF (100KB)	GB, CH, SE, DE, BG, (LV), PL, AT	<p>There are some serious errors in the guideline and some essential information is missing. The information was forwarded to the German calibration service DKD in 2000.</p> <p>Translated to German.</p> <p>The EA10/10 is a very important document. We strongly recommend to update it.</p> <p>KEEP, CONSIDER UPDATE</p>
EA-10/16 (rev.00)	EA Guidelines on the Estimation of Uncertainty in Hardness Measurements	OCT 2001	PDF (167KB)	SE, BG, (LV), PL, AT	<p>Revision of document headed by Dr. Ferrero, IMGC (Italy) is presently under way. Legwork was already presented by K. Herrmann, PTB (examples of Vickers and Brinell procedures).</p> <p>The document is not practical, too complicated and (at our opinion) partly incorrect</p> <p>ALREADY BEING UPDATED, KEEP</p>

2004 Contact persons meeting



29 participants

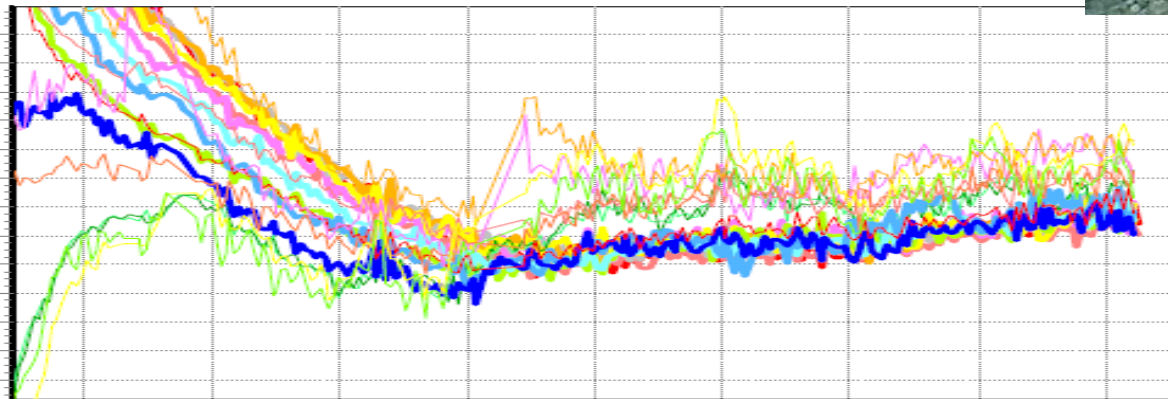
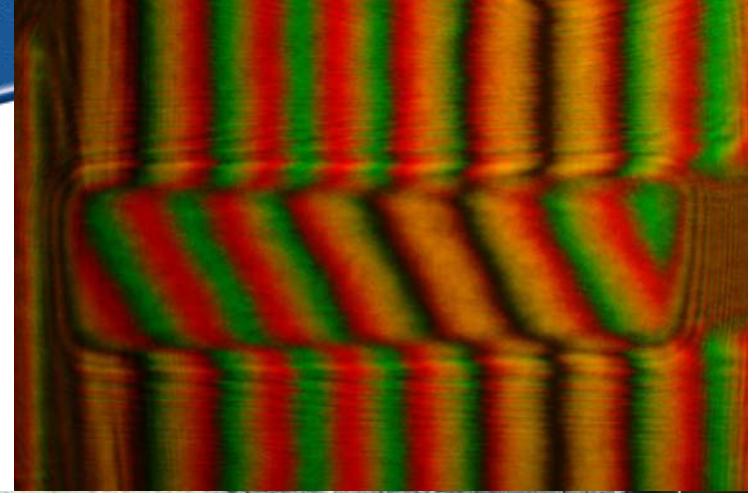
28 countries



EUROMET TC Length
Meeting 2004, IMG C, Torino

2004 Contact persons meeting: Associated workshop

- 'Recent advances & news'
- Two half day sessions
- 10 presentations:
 - Calibration artefacts
 - Metrology for heritage
 - New equipment design
 - Latest results





- TC-L meeting 2005 to be hosted by INM Romania
- 17 – 19 October 2005
- 1.5 day meeting
- 2 x 1/2 day workshop (NANO DG)
- Same week as iMERA (Slovenia) !

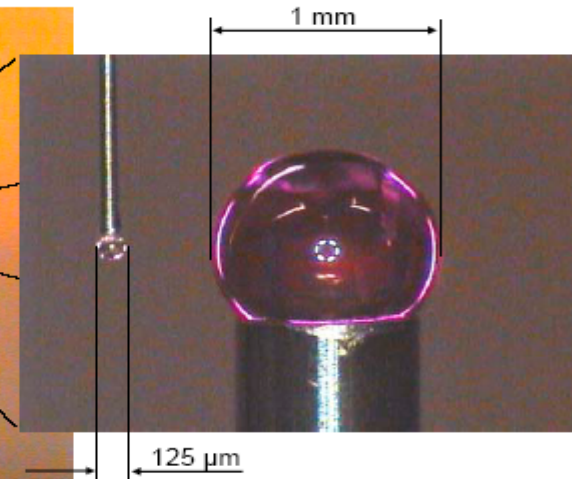
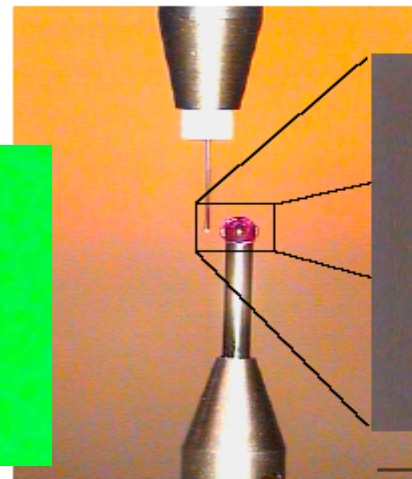
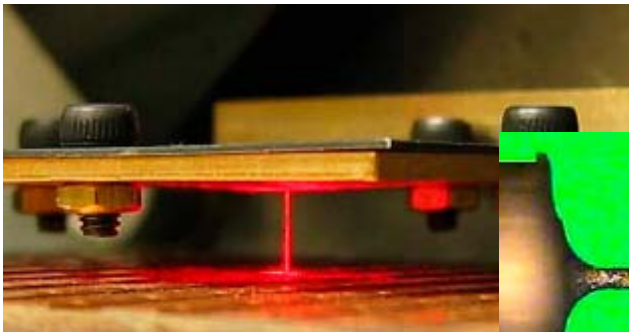


- CMC 'policing' – TCL meeting agenda point
- Key comparison 'Executive reports'
- CMC delays
- iMERA!
- Workshop on KC analysis (CCL-WGDM, Sept 2005)
 - Tuesday 17 Sept 2005



Some science: Micro CMM workshop

- 7-8 April 2005, METAS
- METAS, NPL, PTB, LNE, NMi-VSL, TuE, Univ. Erlangen, Univ. Ilmenau
- 15 participants, active in micro CMM development
- Open discussion – future collaboration
- Possible iMERA candidate project





End of TC-Length Chairman's report 2004/05

