

KCDB REPORT TO THE JCRB

March to September 2018

Introduction

This report summarizes the major progress and evolution of the BIPM Key Comparison Database (KCDB) over the last six months.

The EXCEL files used as a basis for the CMC statistics are available on the [access-restricted JCRB CMC website](#) (on “KCDB statistics”). They are updated successively during the year and the CMCs that have been modified are highlighted in pink according to previous JCRB decisions.

Further information on the KCDB may be found on the BIPM KCDB web pages. Notably, the number of key and supplementary comparisons, as well as the number of CMCs by metrology area and by country, are updated successively during the year and may be consulted on the [KCDB Statistics web page](#)¹.

The status of the database concerning **Calibration and Measurement Capabilities** are given in Section 1. In Section 2, recent information concerning **comparisons** carried out within the frame of the CIPM MRA is summarized. Section 3 highlights the status of **Associates** of the BIPM, and a short summary on progress made on the **revision of the KCDB**, in the context of the Review in the CIPM MRA, is presented in Section 4.

1. CIPM MRA Appendix C : Calibration and Measurement Capabilities

1.1. Status of the KCDB CMC database

Beginning of September 2018, the KCDB included a total of 25 070 CMCs:

- 18 863 in Physics,
- 6 207 in Chemistry.

Additional CMCs are continuously published but the number of CMCs is now quasi stationary as other CMCs are deleted or greyed out. During the last period 330 were also revised. The evolution of the number of CMCs since 2008 is depicted in Figure 1. The number of CMCs presently published in the KCDB by state/economy and metrology area is continuously available on [KCDB Statistics](#).

¹ On request, the KCDB Office may provide an EXCEL file listing information on the present contents of the CIPM MRA Appendix B.

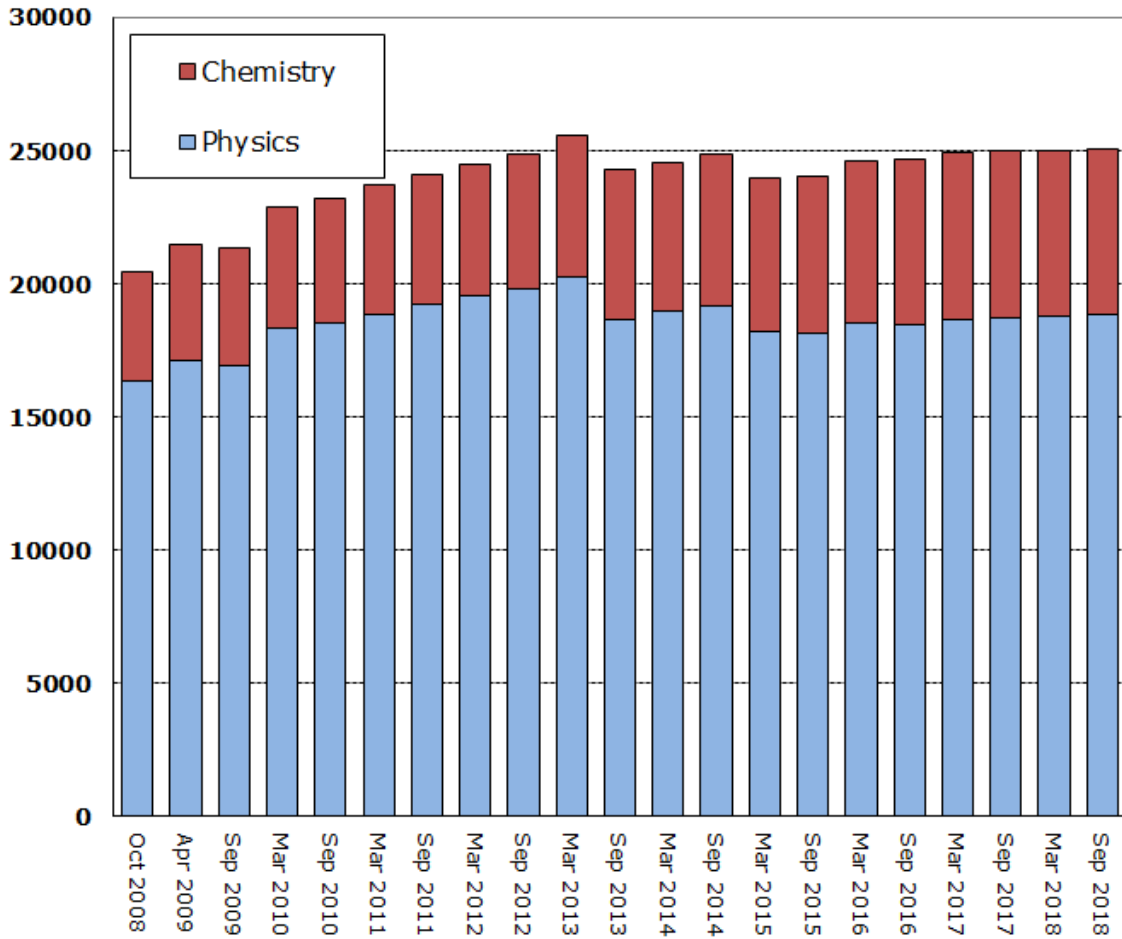


Figure 1. Number of CMCs registered in the KCDB since October 2008.

1.2. CMC publications (excluding revisions)

Azerbaijan, Zimbabwe and Namibia declared their very first CMCs during the last 6 months. Several countries declared CMC for new Metrology Areas or branches: Estonia, Finland, France, Kazakhstan, Poland and Romania.

CMCs treated by the BIPM KCDB Office from 1 March to 1 September 2018 are listed in Table 1².

Table 1. Published CMCs from 1 March to 1 September 2018 (revised CMCs not included)

	RMO / economy	Field	CMCs
April 2018	APMP : ID, MY, SG, TH, TW	T	90
	KZ	M	3
	AU	M	-11
	ZA	AUV	41
May 2018	CN	L	1
	NL	PR	-3
	APMP : HK, NZ, SG, TH	L	14
	CO	TF	-1
	CO	M	2
June 2018	RU	M	2
	BE	M	-2
	AZ	M	1
July 2018	EURAMET : CZ,DE, FI, FR, GB, GR, NL, PL, RO, SI, TR	QM	73
	COOMET : BY, KZ, RU, UA	QM	19
	SIM: BR, PE, UY	QM	17
	BE	M	-2
	FR	RI	-6
	GB	M	1
	CH	M	1
	ZW	T	13
	TR	AUV	2
	August 2018	UY	M
September 2018	NA	M	7
	EURAMET : DE, ES, IT, PT	PR	1
	PE	TF	1
	EURAMET : BE, EE, ES, IT, SI	L	6

² Published CMCs are announced in "[CMCs News](#)".

1.3. Deleted CMCs, Greying out and Re-instatements

Greying-outs, deletion and reinstatements of CMCs are coordinated by the JCRB Executive Secretary, and carried out by the KCDB Office. Table 2 lists the CMCs concerned during the last six months.

The present situation regarding temporary removal (“greying-out”) of CMCs is available on-line of the [Statistics page of the KCDB](#) at the JCRB restricted web, summarized in Table 3. In total 432 CMCs are presently greyed out. The number of greyed out CMCs has doubled since the same period in 2017. This large increase is mainly related to the greying out of all CMCs of the Joint Research Centre at Geel (Belgium).

The dates of the greying-out of CMCs are listed in the spreadsheet “Dates of CMCs greying-out” of the EXCEL file “CMCsNumber_2018, available from the [access-restricted JCRB CMC website](#) (see “KCDB statistics”).

Table 2. Deleted, greyed-out or reinstated CMCs from 1 March to 1 September 2018

Date	State/ economy	Field	Action
28 March	BE	TF	2 greyed out CMCs were deleted
27 April	MX	QM	1 greyed out CMC was deleted
3 May	AL	M	7 CMCs greyed out in Mass – Mass standards
14 May	ZA	M	2 CMCs greyed out in Mass - Pressure
14 May	CN	L	Reinstatement of 1 CMC
30 May	MX	TF	Reinstatement of 9 CMCs
30 May	MX	T	Reinstatement of 15 CMCs
5 July	IGO	RI	110 CMCs greyed out in Ionizing Radiation - Radioactivity
5 July	IGO	QM	80 CMCs greyed out in Chemistry and Biology

Table 3. Number of CMCs temporary removed (“greyed-out”) from the KCDB, by country and by metrology area, as at 1 September 2018.

	AUV	M	PR	EM	T	RI	L	QM	TF	Total
AFRIMETS										
ZA		4								4
Total AFRIMETS:										4
APMP										
AU				27						27
CN							1			1
IN							3			3
JP							3			3
KR								4		4
TH						3	1			4
Total APMP:										42
COOMET										
KZ										0
Total COOMET:										0
EURAMET										
AL		7								7
BE				25					0	25
DE								12		12
FR				3						3
IAEA						1				1
IT		31		15			1	3		50
JCR						110		82		192
LV				30						30
PT							1			1
SK	6						2			8
Total EURAMET:										329
SIM										
MX			22	8	0			1	0	31
AR							0			0
US		3	0	8		1				12
BR								14		14
Total SIM:										57
TOTAL:										432

1.4. CMC statistics of RMOs

(Follow-up of Action 17/1 from the 17th JCRB meeting)

Table 4 summarizes the repartition of CMCs on the different RMOs and international signatories of the CIPM MRA.

Table 4. Information on CMC statistics per RMO

Entity	Total number of CMCs September 2018
AFRIMETS	617
APMP	6023
COOMET	2521
EURAMET	11263
GULFMET ³	0
SIM	4617
ESA	0
IAEA	26
JRC ⁴	0
WMO	3

1.5. CMC Vocabulary

Several Consultative Committees have initiated work on a revised vocabulary on service categories:

- Electro Magnetism services in High Voltage are being revised to be in line with standard bodies;
- Acoustics, Ultrasound and Vibration are revising their vocabulary for Vibration;
- Length revised vocabulary for frequency standards;
- Photometry and Radiometry has revised service expressions;
- Thermometry are since a while reorganizing their classification.

The present database does not allow a modification of vocabulary as a global action – the CMCs for each country must be updated one by one and treated as a revised CMC entry which request additional resources from the NMIs and the KCDB Office.

³ The GULFMET was approved as an RMO on a provisional basis by the CIPM in October 2015.

⁴ Earlier IRMM (EC Geel)

2. CIPM MRA Appendix B : Key and supplementary comparisons

2.1. Present status

On the 19 September 2018 the KCDB covered **1559 published comparisons** distributed as listed in Table 5; 1009 key comparisons and 550 supplementary comparisons. In fact, 70 of the 95 BIPM key comparisons are all part of the BIPM.RI(II)-K1 (SIR equivalent activity). On the other side, 23 continuous BIPM comparisons⁵ cover each tens of completed bi-lateral comparisons carried out between the BIPM and different metrology institutes.

Of the 30 comparisons registered in the KCDB since the last JCRB meeting, 1 comparison was registered for GULFMET. GULFMET has hence now 18 comparisons registered in the KCDB. GULFMET countries participate in 26 comparisons organized by GULFMET, by other RMOs or Consultative Committees.

Table 5. Key and Supplementary Comparisons on 19 September 2018.

Entity	KC	SC
BIPM	95	1
CC	485	31
AFRIMETS	5	23
APMP	140	109
COOMET	47	91
EURAMET	167	183
GULFMET ⁶	4	14
SIM	66	98

Figure 2 shows the evolution of the total number of key (green) and of supplementary (violet) comparisons registered in the KCDB since September 2003. The annual increase of key comparisons seems to have stabilized to around some +40 taking into account the history since 2004. The annual increase of key- and supplementary comparisons is around 6 %. The ratio of supplementary comparisons, 20 % in 2006, has progressively increased to 35 %. It should be noted that the graph also include repeats of key comparisons.

⁵ An new key comparison in medium x-ray dosimetry (BIPM.RI(I)-K9) was recently adopted.

⁶ The GULFMET was approved as an RMO on a provisional basis by the CIPM in October 2015.

The number of new key and supplementary comparisons registered in the KCDB over the one-year period ending at the date indicated on the the abscissa is illustrated in Figure 3.

Updated graphs illustrating the participation in key and supplementary comparisons were made available on the Statistics page of the KCDB in September 2018.

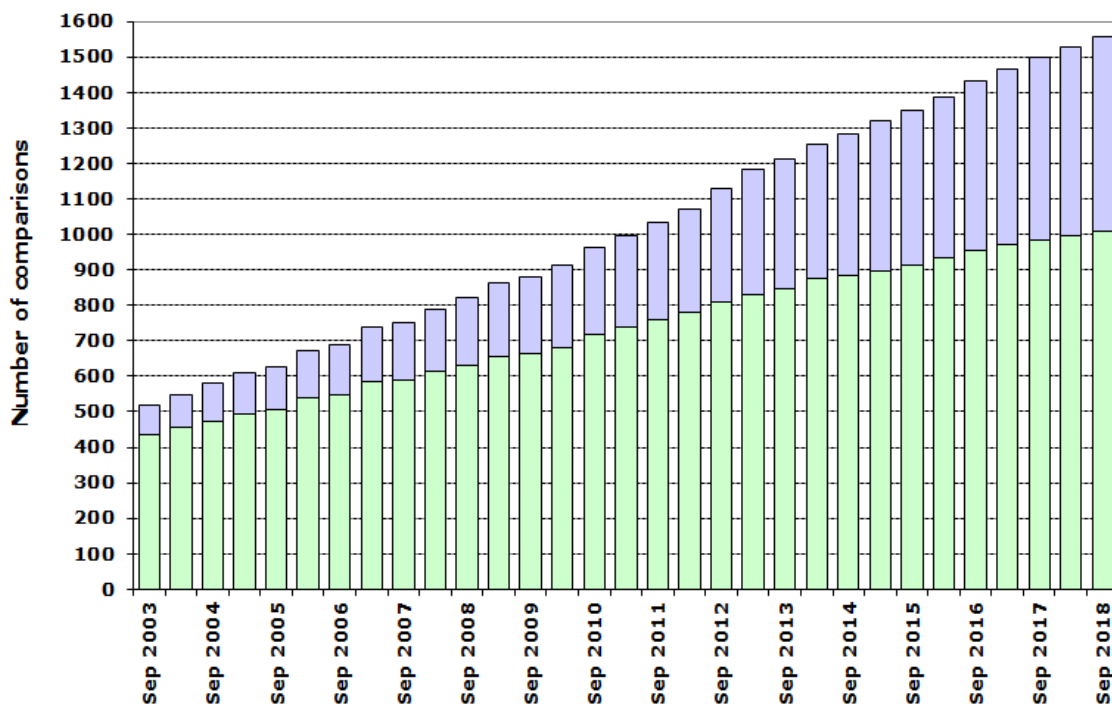


Figure 2. Total number of key comparisons (green) and supplementary comparisons (blue) registered in the KCDB: evolution since September 2003

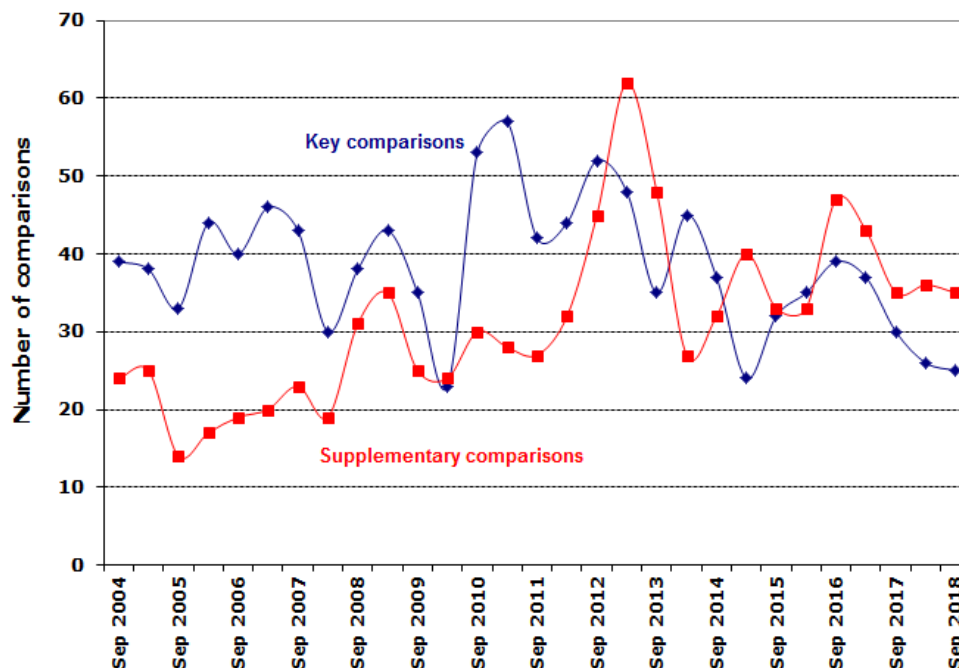


Figure 3. Number of new comparisons registered in the KCDB over the one-year period ending at the date indicated on the abscissa.

2.2. Registrations and modifications of comparisons

From 1 March 2018 the following 30 comparisons were registered as new:

AFRIMETS.AUV.A-S2	APMP.T-S17	EURAMET.PR-K6.2015.1
AFRIMETS.M.F-S1	APMP/M/FF-K6.2018	EURAMET.RI(I)-K9
AFRIMETS.T-S6	BIPM.RI(I)-K9	EURAMET.RI(II)-K2.Ho-166
AFRIMETS.T-S7	CCM.F-K3.1	EURAMET.T-S7
APMP.AUV.U-K3	CCQM-K156	GULFMET.EM-S4
APMP.AUV.V-K3.1	CCRI(II)-S14.Rn-222	SIM.AUV.V-S2
APMP.L-K1.2018	EURAMET.M.H-K1.b	SIM.EM-S15
APMP.M.F-S2.1	EURAMET.M.H-K1.c	SIM.M.F-S7
APMP.QM-S15	EURAMET.M.H-S1.a.b.c	SIM.M.F-S8
APMP.QM-S9.2017	EURAMET.M.H-S2.a.b	SIM.T-K9.2

End of February, 59 abandoned or superseded key and supplementary comparisons were kept in the KCDB archives (included in the presented statistics).

2.3. Published results of key and supplementary comparisons

The following 35 reports were published during the last 6 months:

APMP.L-S8	CCL-K11 (2016)	EURAMET.RI(I)-K1.2
APMP.M.M-K6.1	CCL-K11 (2017)	EURAMET.RI(I)-K4.2
APMP.QM-K111	CCM.V-K3	EURAMET.RI(I)-K5.1
APMP.QM-S9	CCQM-K11.2	EURAMET.RI(I)-S11
APMP.T-K7.1	CCQM-K55.d	EURAMET.RI(I)-S14
BIPM.QM-K1 (CHMI)	CCQM-K6.2	EURAMET.RI(I)-S15
BIPM.QM-K1 (INECC)	COOMET.L-S15	EURAMET.RI(I)-S3.2
BIPM.QM-K1 (NPL)	COOMET.L-S19	SIM.M.D-S5
BIPM.QM-K1 (NPLI)	COOMET.M.P-s5	SIM.M.FF-S11
BIPM.RI(I)-K1 (BFKH)	EURAMET.L-K3.2009.2	SIM.M.M-S11
BIPM.RI(I)-K9 (PTB)	EURAMET.M.P-S14	SIM.QM-K111
BIPM.RI(II)-K2.Pu-238	EURAMET.M.P-S18	

2.4. Follow-up on JCRB Action 33/3

Action 33/3: *The BIPM KCDB office, as part of the KCDB report to the JCRB, to identify Key and Supplementary Comparisons which were started 5 or more years ago and have not reached a conclusion.*

The number of key comparison older than 5 years decreases, while the number of unfinished supplementary comparisons is constant. The total number is decreased by 16 as illustrated in Figure 4. A list of the comparisons concerned may be found in Appendix.

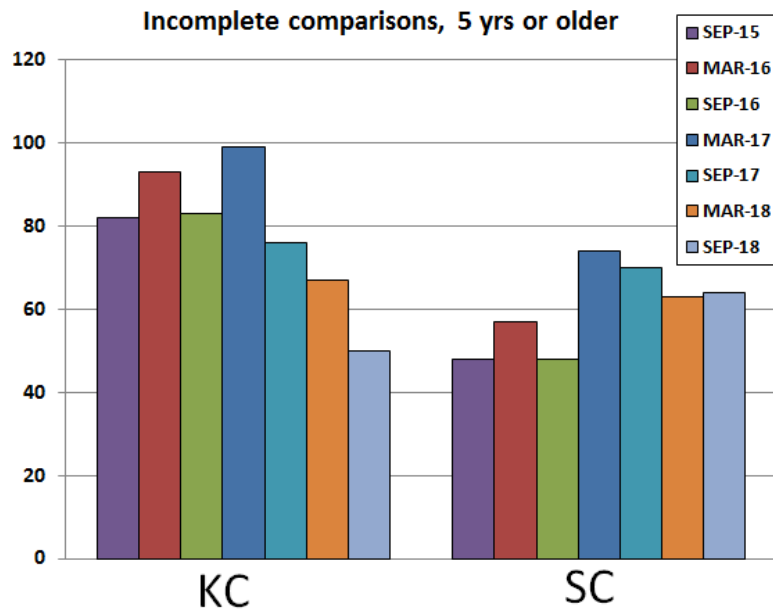


Figure 4. Histogram showing the number of incomplete comparisons that started more than 5 years ago.

3. Participation of Associates of the CGPM in CIPM MRA activities

Table 6 summarizes the participation of the 42 Associates of the CGPM in CIPM MRA activities as at 19 September 2018

Namibia, Azerbaijan and Zimbabwe published their first CMCs. The observed decrease in CMCs during the last 12 months is associated with Ukraine becoming full member of the BIPM. Disregarding the Ukrainian membership, the number of CMCs for associates is steady. The repartition of CMCs among Associates is illustrated in Figures 5 and 6.

The increase in Associate participation in comparisons increased by 6 % and 12 % since last year, for key and supplementary comparisons respectively. The comparison participation by Associates is illustrated in Figure 6.

Table 6. CIPM MRA activity of the NMIs of Associates of the CGPM: important dates, number of published CMCs and participation in key and supplementary comparisons.^{7,8}

Associates of the CGPM and the KCDB: CMCs and participation in key and supplementary comparisons



Associate of the CGPM	Date of becoming an Associate	Date of signature of the CIPM MRA	Published CMCs	Greyed-out CMCs	Date of publication of the first CMC	Area of the first CMC	Key comparisons	Supplementary comparisons
Albania	10 September 2007	10 October 2007	0	7	05 April 2013	Mass Standards	9	4
Azerbaijan	01 January 2015	28 January 2015	1	0	26 June 2018	Mass (viscosity)	1	8
Bangladesh	29 March 2010	25 March 2011	0	0			1	2
Belarus	05 May 2003	14 October 2003	247	0	07 April 2004	Acoustics, Ultrasound and Vibration	36	41
Bolivia	04 April 2008	16 May 2008	19	0	19 July 2016	Chemistry	6	21
Bosnia and Herzegovina	24 May 2011	15 June 2011	59	0	08 June 2012	Mass Standards	13	8
Botswana	30 May 2012	26 July 2012	0	0			1	4
CARICOM	10 October 2005	12 October 2005	0	0			0	12
Chinese Taipei	26 April 2002	04 June 2002	390	0	21 October 2003	Mass Standards, Force, Hardness, Pressure	96	48
Costa Rica	29 January 2004	06 October 2004	67	0	26 November 2008	Mass Standards	20	30
Cuba	19 December 2000	18 June 2001	113	0	02 May 2005	Ionizing radiation (I and II)	6	19
Ecuador	20 November 2000	15 April 2001	20	0	16 September 2011	Mass Standards	4	19
Estonia	27 January 2005	23 March 2005	16	0	05 May 2014	Humidity	9	12
Ethiopia	01 January 2018	08 January 2018	0	0			0	2
Georgia	01 January 2008	17 June 2008	30	0	20 March 2014	Thermometry	7	10
Ghana	17 September 2009	24 February 2010	0	0			2	6
Hong Kong, China	08 April 2000	31 May 2000	253	0	13 December 2000	Length (Laser, Dimensional)	79	25
Jamaica	15 September 2003	21 July 2004	22	0	24 August 2006	Mass Standards	6	9
Kuwait (State of)	23 March 2018	12 July 2018	0	0			2	3
Latvia	11 January 2001	13 March 2001	29	30	23 March 2005	Length (Dimensional)	13	8
Luxembourg	29 January 2014	01 October 2014	0	0			3	1
Macedonia (fmr Yugoslav Rep.)	10 October 2006	14 November 2007	23	0	02 July 2013	Fluid Flow	8	9
Malta	11 April 2001	20 June 2001	0	0			5	3
Mauritius	05 October 2010	09 March 2011	0	0			2	2
Moldova, Republic of	01 January 2007	14 November 2007	43	0	26 September 2013	Thermometry	4	13
Mongolia	07 August 2013	23 October 2013	0	0			4	4
Namibia	10 August 2012	16 October 2012	7	0	10 September 2018	Mass Standards	0	3
Oman	08 May 2012	20 November 2014	0	0			1	2
Panama	03 August 2003	16 September 2003	37	0	11 September 2006	Mass Standards	8	17
Paraguay	06 May 2009	27 October 2009	24	0	31 January 2011	Mass Standards	2	17
Peru	28 May 2009	17 November 2009	113	0	03 August 2010	Mass Standards	25	32
Philippines	01 June 2002	19 December 2002	31	0	18 December 2013	Mass Standards	13	8
Qatar	10 March 2016	16 March 2016	0	0			3	1
Seychelles	10 September 2010	12 November 2010	0	0			0	3
Sri Lanka	14 November 2007	14 November 2007	0	0			6	2
Sudan	26 June 2014	26 June 2014	0	0			0	1
Syrian Arab Republic	31 May 2012	17 September 2012	0	0			12	3
Tanzania	1 January 2018	16 April 2018	0	0			0	0
Uzbekistan							48	61
Viet Nam	10 October 2003	16 September 2004	31	0	21 July 2010	Time and Frequency	32	8
Zambia	10 December 2010	3 February 2011	0	0			2	7
Zimbabwe	14 September 2010	14 January 2011	13	0	17 July 2018	Thermometry	1	7

Total: 1588 37

Total: 490 495

⁷ These numbers take into account all comparisons registered in the KCDB, disregarding status, for which at least one laboratory of the Associate is listed in the participants list.

⁸ As the numbers on participation in key and supplementary comparisons change comparatively slowly with time, the corresponding KCDB statistics are updated every six months (in May and November of each year). However, the numbers of CMCs published in the KCDB varies more rapidly and are updated more frequently. The numbers given here show the situation as on 19 September 2018.

Figure 5. Graph on the number of CMCs declared by Associates of the CGPM

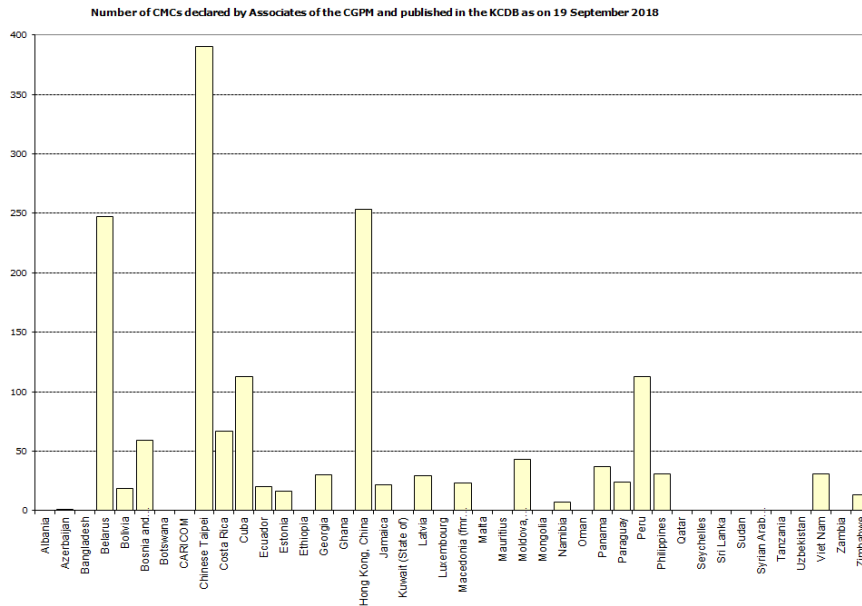
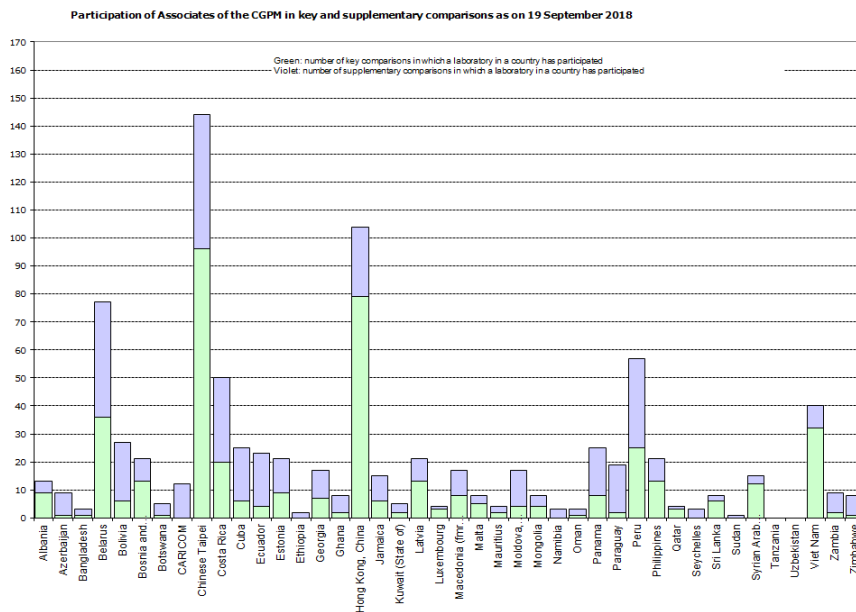


Figure 6. Graph on the participation of Associates of the CGPM in key and supplementary comparisons



4. Revision of the BIPM KCDB

The development of the KCDB 2.0 is divided into 3 batches: CMCs, Comparisons and Statistics.

The architecture of the CMC web pages has been completed. This covers both the intra- and JCRB review support. Overview of submitted CMCs will be available in table form where most columns can be sorted and filtered.

The user and account structure has been defined. Apart from the open access, common JCRB contents may be accessed via the ordinary TC-Guest account. User account will be non-nominal for TC-Chairs and WG-Chairs for which the account may be passed on to the successor. Individual user accounts will be possible, where the request to create an account is made via a restricted web page. User accounts will be associated to a metrology area and branch and the TC-Chair (or the KCDB Office) may approve the creation of an account.

The search facilities have been set. The free keyword search will generate a presentation of CMCs similar to that of today, with the possibility to refine the filter. An advance search (based on a menu) will instead generate CMCs in table form, with the possibility to sort and filter on most columns, and apply an additional numerical filter.

The functional specifications for CMCs have been approved by the BIPM and the CMC batch is presently under development.

CCL has claimed quantity based equations since 2012 and was supported by the CIPM at their meeting in June 2018. The transition towards quantity based equations (instead of numerical equations presently used) requests a revision by those institutes having equations. The CCL WG-MRA has been contacted for feedback. Notably, we need to give guidance how to revise numerical based equations to become quantity based.

CCPR has a large number of multi-dimensional quantities, color related quantities and multiple units for the same CMCs. We interacted at the RMOWG meeting in July and have found a solution on how to integrate this into the KCDB 2.0.

A recent CMC submission from EURAMET in hardness triggered interaction with the CCM-WGH. Hardness is represented by several scales and measurands. We have made a suggestion on how to integrate this into the KCDB 2.0.

CCRI is still working on how to classify CMCs. We have picked up their new numbering scheme so that this may be included into the KCDB 2.0.

The CCQM did not request an additional classification of their CMCs. Nevertheless, we have foreseen the possibility not only classifying the CMCs by the CCQM scheme, but also attributing and index to which working group (expertise) it may be associated. This will provide a future possibility to get supplementary information on the analyte and facilitate the choice of reviewer.

The launch of KCDB 2.0 is foreseen in 2019.

Acknowledgement

The development work on the KCDB 2.0 involves also Chingis Kuanbayev, Nikita Zviagin (JCRB Executive Secretary) and the BIPM IT-team - Laurent Le Mée and Thierry/ Many thanks for their contribution. The support to the KCDB Office by Nikita is also acknowledged.

APPENDIX List of uncompleted comparisons older than 5 years

a) Key Comparisons

KC identifier	Status Sep-2018	Indicated year	Pilot
AFRIMETS.M.P-K2	In progress	2012 - 2013	NMISA
APMP.EM.BIPM-K11.2	Report in progress, Draft B	2004	Puslit KIM-LIPI
APMP.EM.RF-K8.CL	Measurements completed	2012 - 2013	NMIJ AIST
APMP.EM-K2	In progress	2010 - 2011	KRISS
APMP.EM-K5.1	Report in progress, Draft A	2010 - 2013	NIM
APMP.M.D-K4	Report in progress, Draft A	2007 - 2008	KRISS
APMP.M.F-K2	Report in progress, Draft A	2007 - 2013	KRISS
APMP.M.F-K3.a	In progress	2011 -	NIM
APMP.M.F-K3.b	In progress	2011 -	NIM
APMP.M.H-K1.b	Report in progress, Draft A	2003 - 2005	NMIJ AIST
APMP.M.H-K1.c	Report in progress, Draft A	2003 - 2005	NMIJ AIST
APMP.M.M-K2.2	In progress	2010	KRISS
APMP.M.P-K1.c.2	Report in progress, Draft B	2012	KRISS
APMP.M.P-K9	Report in progress, Draft A	2009 -	NMIA
APMP.M.P-K9	Report in progress, Draft A	2009 -	KRISS
APMP.PR-K2.a.1	Measurements completed	2010 - 2012	NMIA
APMP.PR-K2.b.1	In progress	2010 - 2012	NMIA
APMP.PR-K3.a.1	Measurements completed	2006	NIM
APMP.RI(I)-K2.B	Report in progress, Draft A	2007	NMIJ AIST
APMP.RI(I)-K4	Report in progress, Draft A	2009 - 2010	INER
APMP.T-K8	In progress	2011 - 2013	NMIJ AIST
CCL-K1.2011	In progress	2011 - 2014	NRC
CCL-K1.2011	In progress	2011 - 2014	CENAM
CCM.FF-K2.2011	In progress	2013	VSL
CCM.F-K3.a	Report in progress, Draft A	2005 - 2007	PTB
CCM.F-K3.b	Report in progress, Draft A	2005 -	PTB
CCQM-K110	Postponed	2012	IRMM
CCQM-K110	Postponed	2012	GL
CCQM-K110	Postponed	2012	NIMC
CCRI(II)-K2.Tc-99	In progress	2012 - 2013	NPL
CCRI(III)-K9.AmBe.1	Report in progress, Draft A	2012 - 2013	NPL
CCT-K1.1	Report in progress, Draft A	2006 - 2014	NIST
CCT-K6.1	Report in progress, Draft A	2008 - 2010	NPL
CCT-K9	Measurements completed	2011 - 2012	NIST
COOMET.AUV.V-K1	Report in progress, Draft B	2007 - 2008	VNIIM
COOMET.L-K3	Report in progress, Draft A	2011 - 2012	VNIIM
COOMET.PR-K3.a	Report in progress, Draft A	2009 - 2011	BelGIM
EURAMET.M.D-K1.1	Report in progress, Draft A	2008 - 2012	PTB

(continued...)

KC identifier	Status Sep-2018	Indicated year	Pilot
EURAMET.M.M-K2.4	Protocol complete	2013	DFM
EURAMET.M.P-K7	Report in progress, Draft B	2005 - 2007	MIKES
EURAMET.PR-K2.a	Measurements completed	2010 - 2012	VSL
EURAMET.T-K3.4	Report in progress, Draft A	2010 - 2011	MIRS/UL-FE/LMK
EURAMET.T-K8	Report in progress, Draft A	2008 - 2012	PTB
EUROMET.M.F-K1	Report in progress, Draft B	2002 - 2004	MIKES
EUROMET.M.F-K3	In progress	2005 -	PTB
SIM.M.P-K1	Protocol complete	2008 - 2010	CENAM
SIM.M.P-K6	Report in progress, Draft A	2008 - 2011	CENAM
SIM.M.P-K6.1	Report in progress, Draft B	2011 - 2013	LACOMET
SIM.M.P-K7	Report in progress, Draft B	2001	CENAM
SIM.QM-K1	Report in progress, Draft B	2009	INMETRO

b) Supplementary Comparisons

SC identifier	Status Sep-2018	Indicated year	Pilot
AFRIMETS.L-S4	In progress	2012	PTB
AFRIMETS.M.M-S3	In progress	2013	NIS
AFRIMETS.RI(I)-S1	In progress	2011 - 2013	NMISA
AFRIMETS.T-S2	In progress	2012	NMISA
AFRIMETS.T-S3	In progress	2012	NMISA
APMP.EM-S8	Protocol complete	2011 - 2013	NPLI
APMP.L-S5	In progress	2012	CMS
APMP.L-S5	In progress	2012	NMIJ AIST
APMP.M.G-S1	Report in progress, Draft A	2012	NIM
APMP.M.H-S4	Report in progress, Draft A	2011	KRISS
APMP.M.MM-S1	In progress	2012 - 2013	KRISS
APMP.M.M-S1	Planned	2007	NPSL
APMP.M.P-S1	Measurements completed	2003 - 2005	CMS/ITRI
APMP.M.P-S1	Measurements completed	2003 - 2005	SPRING Singapore
APMP.PR-S1.2	Protocol complete	2008	NMC, A*STAR
APMP.PR-S5	Measurements completed	2008 - 2009	NMIJ AIST
APMP.PR-S6	In progress	2012 - 2013	KRISS
APMP.RI(I)-S1	Report in progress, Draft B	2010 - 2011	OAP
APMP.RI(II)-S3.Cs-134.Cs-137	Report in progress, Draft A	2013	NMIJ AIST
APMP.T-S10	Planned	2013	KRISS
APMP.T-S9	Planned	2013	NMIJ AIST
CCRI(II)-S10	Report in progress, Draft A	2011 - 2012	ENEAN-INMRI
CCRI(II)-S6.Co-57	Report in progress, Draft B	2008	IAEA
CCRI(II)-S6.I-131	Report in progress, Draft B	2006	IAEA
CCRI(II)-S9	Report in progress, Draft A	2011	KRISS
CCT-S2	Report in progress, Draft B	2007 - 2010	LNE
CCT-S3	Report in progress, Draft A	2007 - 2008	NMIJ AIST
COOMET.EM.RF-S1	Report in progress, Draft B	2009	VNIIFTRI
COOMET.EM-S10	Report in progress, Draft B	2010 - 2012	VNIIIMS
COOMET.EM-S15	Planned	2013	SNIIM
COOMET.EM-S6	Report in progress, Draft B	2007 - 2010	VNIIIMS
COOMET.EM-S7	Report in progress, Draft B	2009 - 2011	VNIIIMS
COOMET.EM-S9	In progress	2009	VNIIFTRI
COOMET.M.FF-S2	Report in progress, Draft B	2008 - 2009	PTB
COOMET.M.FF-S4	Report in progress, Draft B	2009 - 2010	SMU
COOMET.M.F-S1	Report in progress, Draft B	2008 - 2010	VNIIIM
COOMET.M.H-S4	Report in progress, Draft B	2007 - 2010	VNIIFTRI

(continued...)

SC identifier	Status Sep-2018	Indicated year	Pilot
COOMET.PR-S1	Measurements completed	2012 - 2013	VNIIOFI
COOMET.PR-S2	Report in progress, Draft B	2011 - 2012	VNIIOFI
COOMET.PR-S5	Measurements completed	2008 - 2011	INIMET
EURAMET.EM-S33	In progress	2010 - 2011	LCOE
EURAMET.EM-S34	Protocol complete	2010 - 2011	LCOE
EURAMET.EM-S35	Protocol complete	2012 - 2013	INRIM
EURAMET.EM-S37	In progress	2011 - 2013	CMI
EURAMET.M.F-S2	In progress	2012 - 2013	BEV
EURAMET.M.M-S5	Planned	2012 - 2013	NSAI NML
EURAMET.PR-S4	Measurements completed	2012 - 2013	LNE
EURAMET.PR-S5	Measurements completed	2012 - 2013	PTB
SIM.M.FF-S4	Report in progress, Draft B	2006	INIMET
SIM.M.F-S2	Planned	2012	IDIC
SIM.M.F-S3	Report in progress, Draft B	2012 - 2013	NIST
SIM.M.F-S4	Protocol complete	2012 - 2013	IDIC
SIM.M.M-S6	Report in progress, Draft B	2009	CESMEC Ltda.
SIM.M.P-S2	In progress	2009 - 2011	INMETRO
SIM.M.P-S3	Protocol complete	2010	LCPN-P
SIM.M.P-S4	Protocol complete	2010	LCPN-P
SIM.M.P-S8	Planned	2012	ENAER
SIM.M.P-S9	Planned	2012	ENAER
SIM.PR-S3	Protocol complete	2012	NIST
SIM.QM-S3	Report in progress, Draft A	2012	NIST
SIM.QM-S4	Report in progress, Draft A	2012	NIST
SIM.T-S3	Report in progress, Draft B	2007 - 2008	CESMEC Ltda.
SIM.T-S3	Report in progress, Draft B	2007 - 2008	INEN
SIM.T-S4	Report in progress, Draft B	2008	PTB