

# The BIPM key comparison database



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## The BIPM key comparison database

The KCDB is a **public-access website**

<http://www.bipm.org/kcdb>

built up upon a number of databases and  
maintained by the BIPM



“The BIPM key comparison database” is a historic term that does not describe its actual content. It is generally known as “The KCDB”.

All the information it contains is  
**internationally reviewed and recognized**  
through the procedures described in the text of the  
CIPM MRA and  
**always kept up to date**

## The CIPM MRA operation

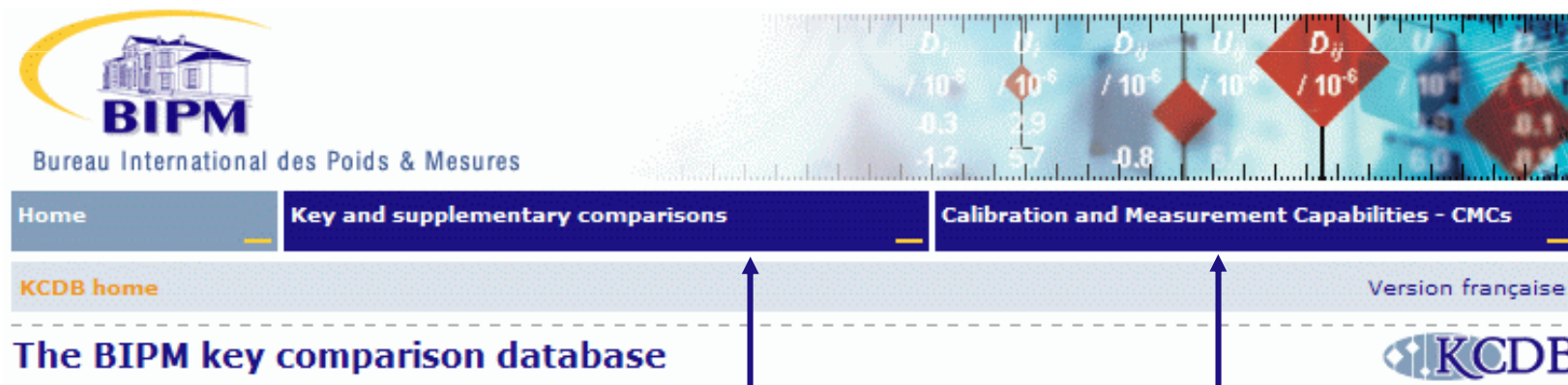
### Participants in the CIPM MRA:

- participate in “**key comparisons**” organized by the CIPM’s Consultative Committees or by the Regional Metrology Organizations, chosen to characterize activities and calibration services in a particular technical area,
- declare the uncertainties associated with their **Calibration and Measurement Capabilities (CMCs)** used in day to day services and have these validated by international experts on the basis of results obtained in key and other international comparisons, and
- have installed an approved Quality System.

Participants in the CIPM MRA: about 220 Metrology Institutes, from about 80 countries all over the world, maintaining national standards and delivering traceability to the SI in their respective countries.

## Data available in the KCDB

- Results of these **key** (and other international) **comparisons** when they are approved by the appropriate body (CIPM's Consultative Committees or Regional Metrology Organizations), and
- Lists of **Calibration and Measurement Capabilities (CMCs)** declared by each participant in the CIPM MRA when these have been validated.



**EQUIVALENCE OF  
NATIONAL STANDARDS**

**ACCEPTANCE OF  
CERTIFICATES**

## Key comparisons

### Definition:

A key comparison is one of the set of comparisons **selected by a Consultative Committee (CC) of the CIPM** to test the principal techniques and methods in the field

Results: interpreted in terms of equivalence

**degrees of equivalence** of each participant relative to an agreed reference value (offset + uncertainty) are shown in **graphs of equivalence**

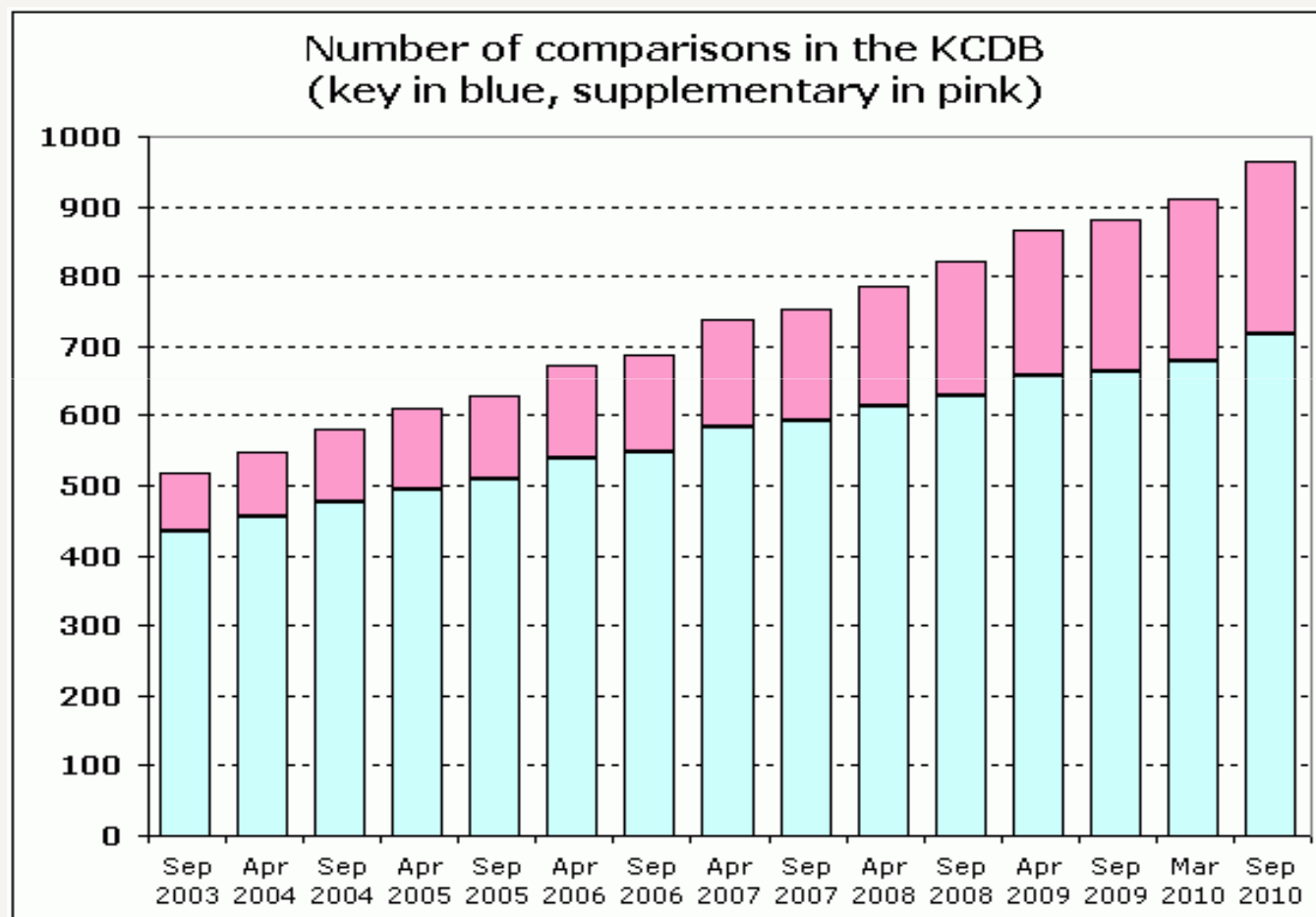


**EQUIVALENCE OF  
NATIONAL  
STANDARDS**

Since 1999, ~ 1000 comparisons have been recorded in the KCDB. They cover all Metrology areas: ~740 key comparisons and ~260 supplementary comparisons.

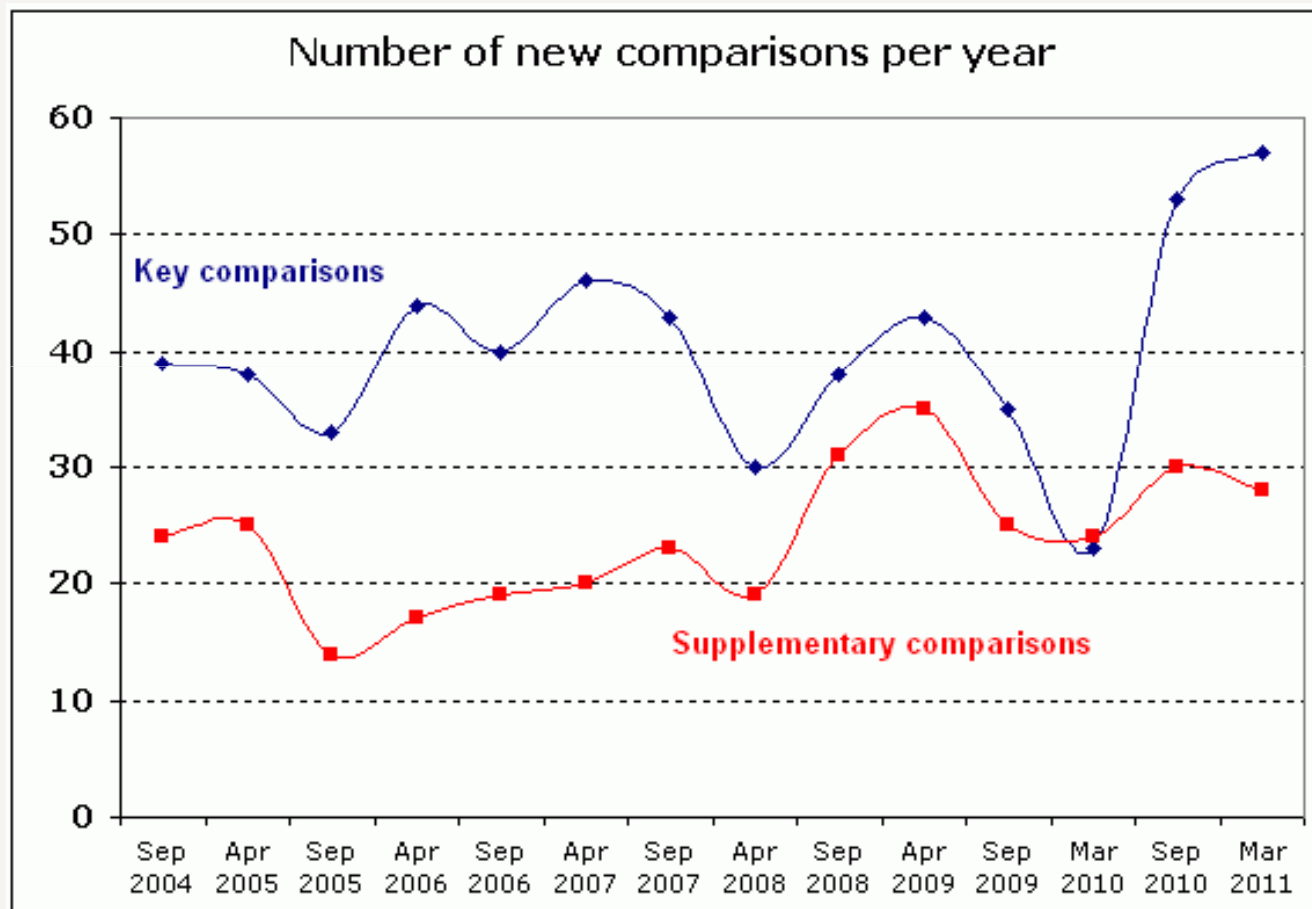
## Key and supplementary comparisons

Evolution over the last years

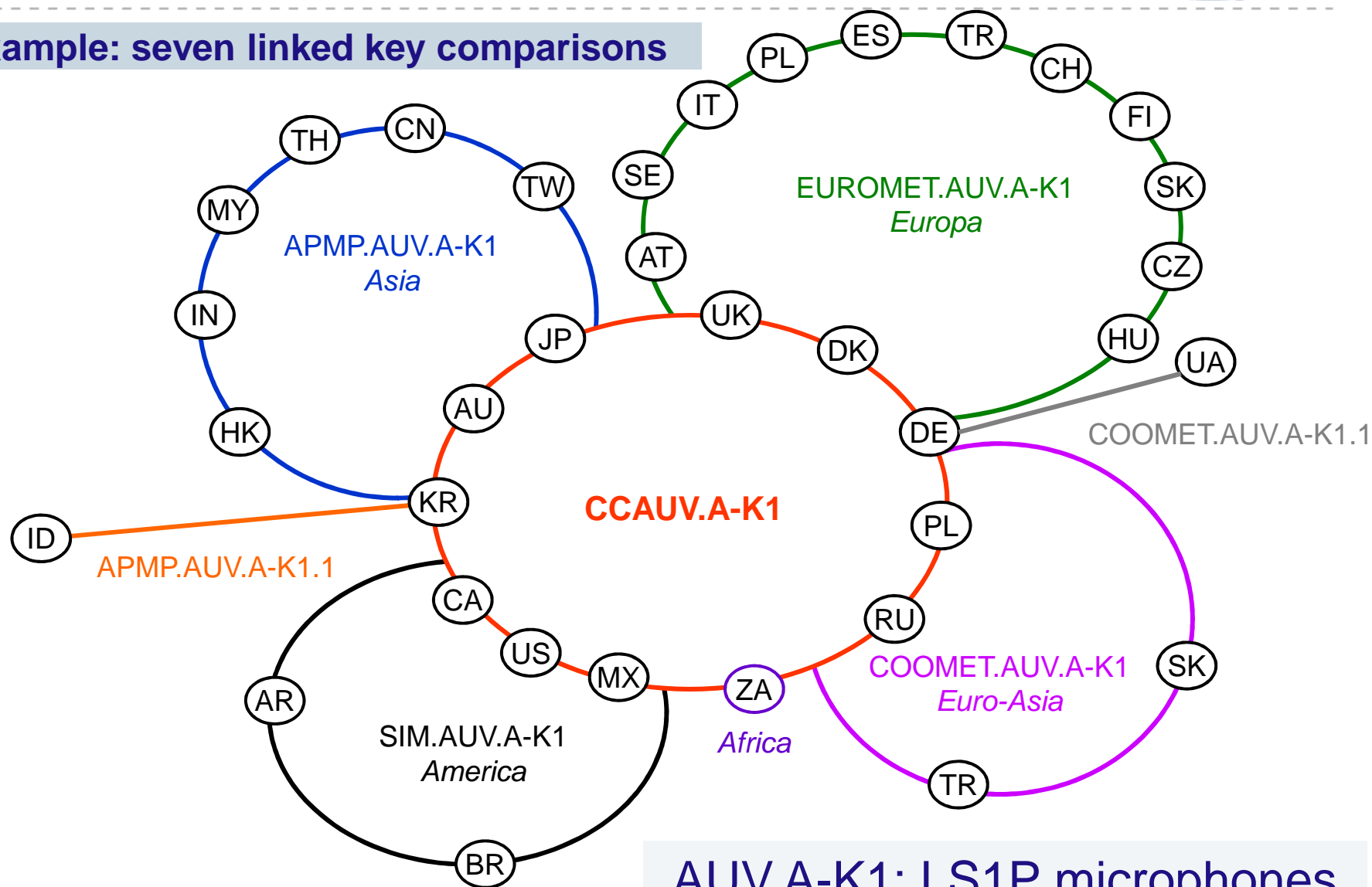


## Key and supplementary comparisons

Evolution over the last years

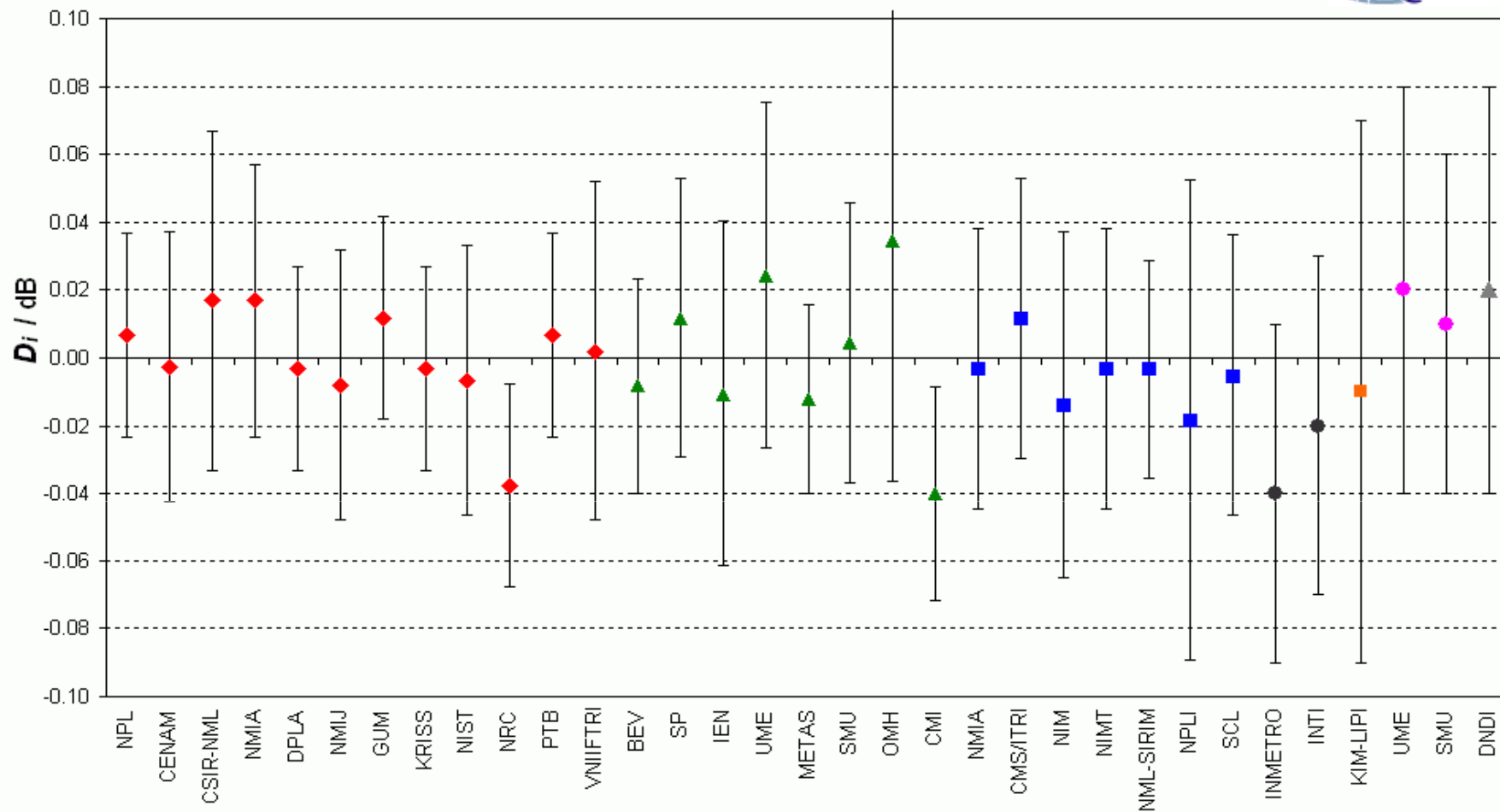


Example: seven linked key comparisons





CCAUV.A-K1, and EUROMET, APMP, and SIM.AUV.A-K1, APMP.AUV.A-K1.1, COOMET.AUV.A-K1, and  
COOMET.AUV.A-K1.1 - Microphone LS1P, frequency 250 Hz  
Degrees of equivalence [ $D_i$  and its expanded uncertainty  $U_i$  ( $k = 2$ )]



Red diamonds : CCAUV.A-K1 participants

Green triangles : EUROMET.AUV.A-K1 participants only

Blue squares : APMP.AUV.A-K1 participants only

Black circles : SIM.AUV.A-K1 participants only

Orange square : APMP.AUV.A-K1.1 participant only

Pink circles : COOMET.AUV.A-K1 participants only

Grey triangle : COOMET.AUV.A-K1.1 participant only

The KCDB displays two other examples of seven key comparisons linked together: [AUV.V-K1](#) and [M.M-K1](#)

## Results of key comparisons

Status in the KCDB (11 October 2010)

- Final Reports posted in the KCDB for 65 % of the comparisons registered
- Tables of results, degrees of equivalence and graphs of equivalence published in the KCDB for key comparisons only
- A total of ~ 1530 graphs of equivalence
- Nearly all Final Reports published in the series of *Metrologia Technical Supplements*

List of most recent publications available in "[Comparisons News](#)"

## Calibration and Measurement Capabilities - CMCs

### Recognition: the CIPM MRA Logo and Statement

CMCs published in the KCDB are drawn up by the declaring Institute, reviewed and **approved** by international experts from the different Regional Metrology Organizations and **covered by an approved QS** (compliant with ISO/IEC 17025).

Certificates supported by CMCs published in the KCDB are accepted worldwide by all participants at whatever accuracy is stated in the KCDB.



*On 1st April 2011, 90 National Metrology Institutes (or Designated Institutes) had asked, and received, permission to use the CIPM MRA Logo on their measurement certificates supported by published CMCs.*

## Calibration and Measurement Capabilities - CMCs

Situation as on 04 April 2011

23 704 CMCs published in the KCDB:

- 14 999 in General Physics,
- 3 864 in Ionizing Radiation, and
- 4 841 in Chemistry.

+ ~ 1 000 CMCs over the last year.

Details given in the KCDB Statistics page: [click here](#)

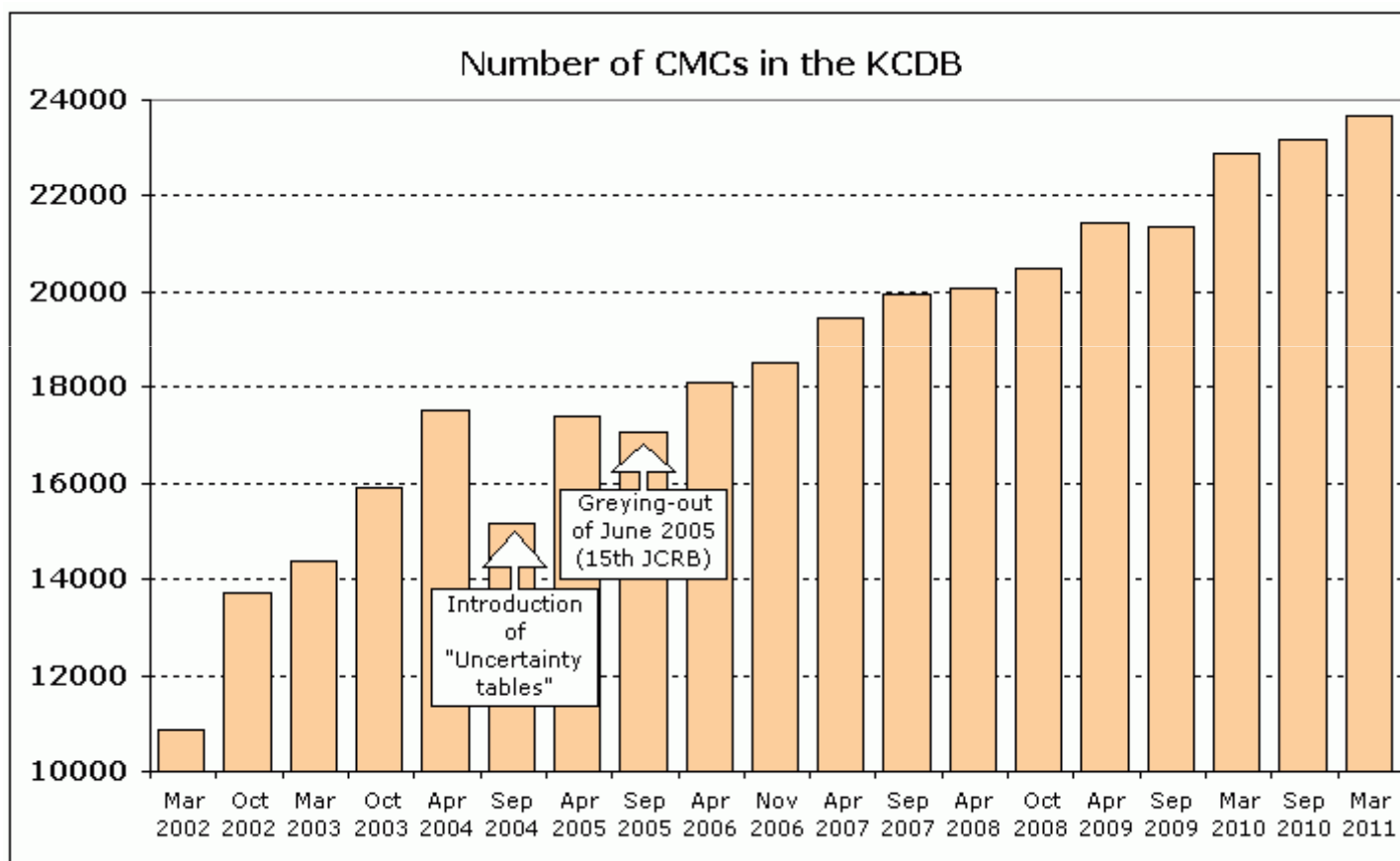
19 of the 32 Associates participant in the CIPM MRA have no CMCs published in the KCDB.

Three Associates have not yet signed the CIPM MRA.

*A few hundreds of CMCs are temporarily removed (“greyed-out”) from the KCDB for different reasons, but mainly because they are (temporarily) not covered by an approved Quality System.*

## Calibration and Measurement Capabilities - CMCs

Evolution over the last six years



## Visits to the KCDB website

Study over January – December 2010

- ~ 7200 different visitors open a total of ~ 100 000 KCDB web pages each month
- Compared with the year 2009, the number of visitors is now nearly constant, but each visitor consults more and more pages and download more and more PDF files
- All pages (News, FAQs, Statistics, information on comparisons and CMCs, etc.) are equally visited

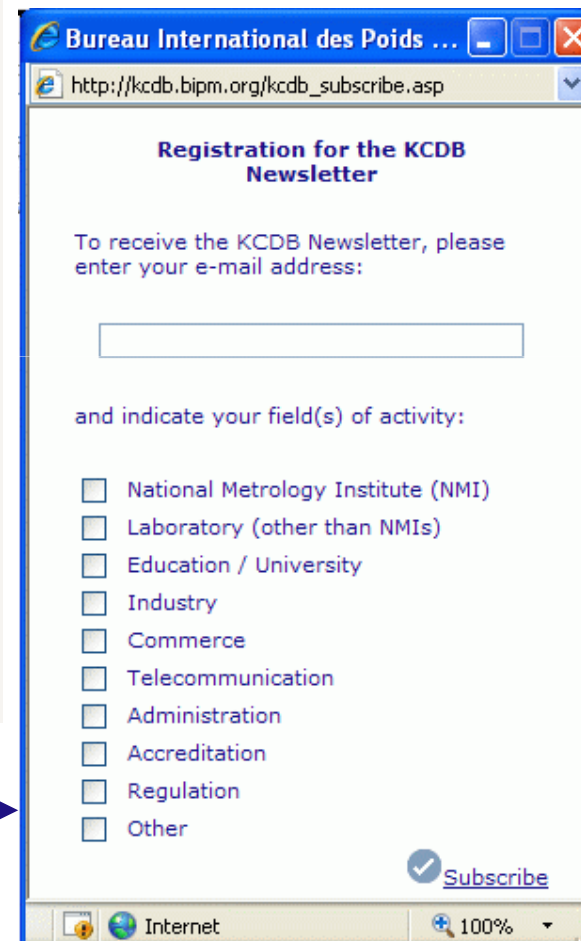
*Visitors come from all over the world. They reach the KCDB website from:*

- *links proposed in other websites (36 %)*
- *Internet search engines (4 %)*
- *personal bookmarking, direct URL address typing or using links given in e-mails (60 %)*

## The KCDB Newsletter

- The *KCDB Newsletter* is issued twice a year (June and December), last issue: No 14 in December 2010
- A place for news on the CIPM MRA, the JCRB, and the KCDB and other BIPM events
- Distributed to thousands of e-mail addresses, posted in the KCDB website and advertised in the NCSLI and CFM Bulletins

*Subscribe for our  
KCDB Newsletter*



The screenshot shows a web browser window titled "Bureau International des Poids et Mesures" with the address bar displaying "http://kcdb.bipm.org/kcdb\_subscribe.asp". The page content is titled "Registration for the KCDB Newsletter". It prompts the user to "To receive the KCDB Newsletter, please enter your e-mail address:" followed by a text input field. Below this, it asks to "and indicate your field(s) of activity:" with a list of checkboxes: National Metrology Institute (NMI), Laboratory (other than NMIs), Education / University, Industry, Commerce, Telecommunication, Administration, Accreditation, Regulation, and Other. A "Subscribe" button with a checkmark icon is at the bottom right. The browser's status bar at the bottom shows "Internet" and "100%" zoom.