

CGPM 2011 CCAUV Report

President: Dr Joaquín Valdés [CIPM]

Executive Secretary: Dr Susanne Picard [BIPM]





18 members and 14 observers

New member since last CGPM: National Metrology Institute of Turkey [UME]

New observer since last CGPM: Bulgarian Institute of Metrology [BIM]

Dr Penny Allisy-Roberts stepped down as Executive Secretary in December 2010

CCAUV Working Groups:

Regional Metrology Working Group

Coordinate RMO requests and CMC reviews

To identify where key and supplementary comparisons may be needed

Created a data base collating expertise

Met in 2008 and 2010

Strategic Planning Working Group

Establish a view on emerging requirements for CCAUV metrology

Share information on national priorities

New document on “Future Needs in Metrology” being prepared

Set up Terms of Reference

Met in 2008 and 2010

Key Comparison Working Group

Examine all relevant documents for each key comparison

Give advice on key comparison related questions

Working Group Chairman nominated in 2011

First meeting to be held in 2012

Since the last CGPM:

3 CIPM key comparisons have been published

1 CIPM key comparison is in progress

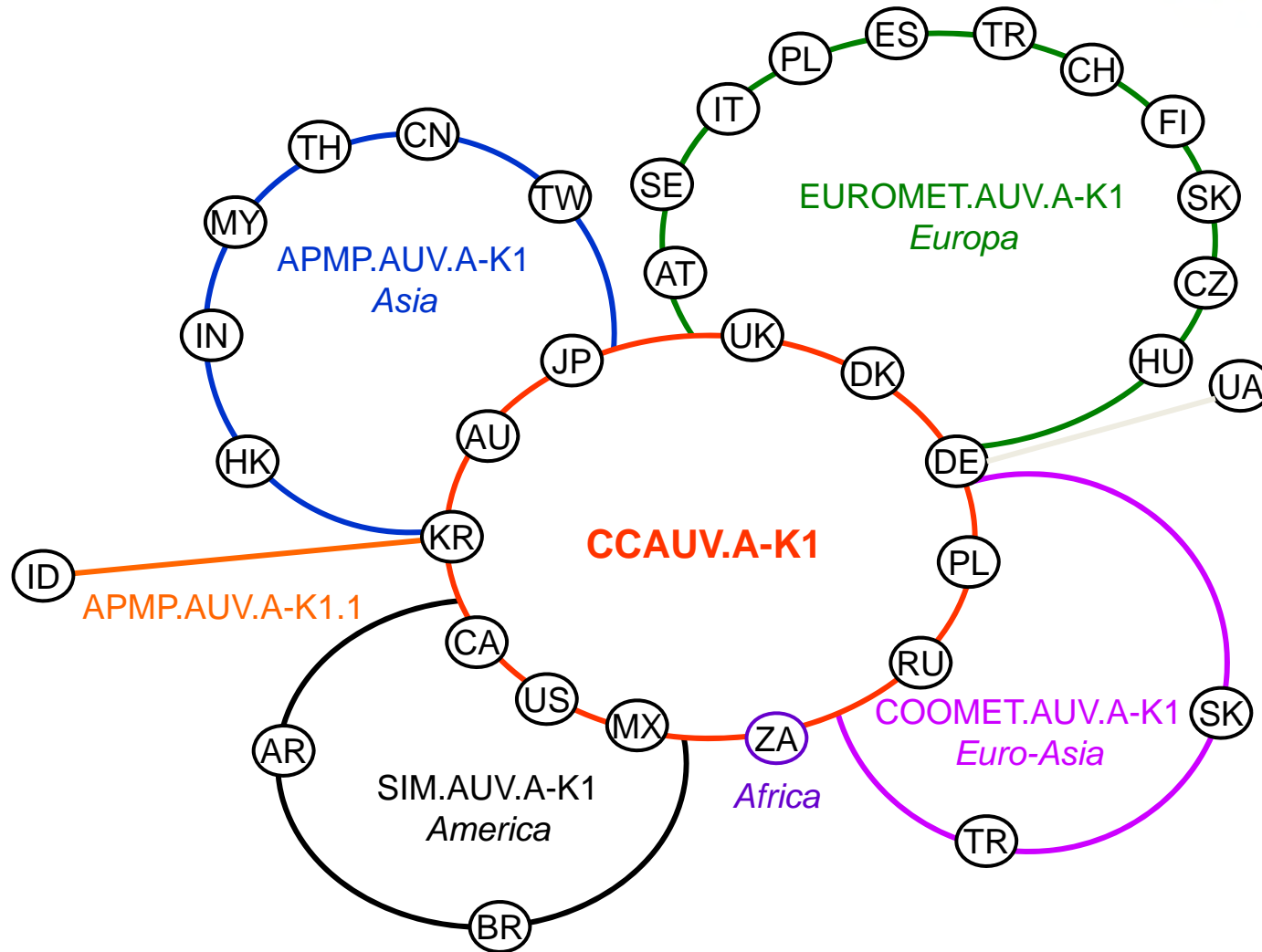
2 CIPM key comparisons have been defined and started

AUV.A-K1: LS1P microphones

7 linked key comparisons



24th meeting of the CGPM 2011



Since the last CGPM:

10 RMO key comparisons have been published*

2 RMO key comparisons are in progress*

6 RMO key comparisons have been defined and started*

** including supplementary comparisons*

Exemples of advance in AUV research, new developments and applications



Metrologia **47** 2010

1) AUV for materials testing

Metrologia special issue:

Materials metrology

edited by

Dr Seton Bennett (CIPM)

National Physical

Laboratory, Teddington, UK

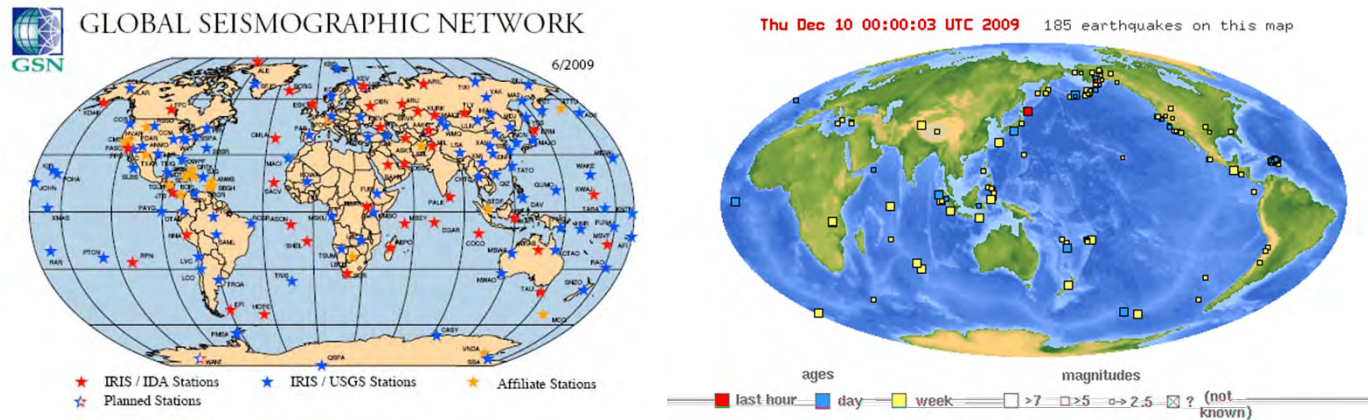
Dr Joaquin Valdés (CIPM)

Instituto Nacional de

Tecnología Industrial,

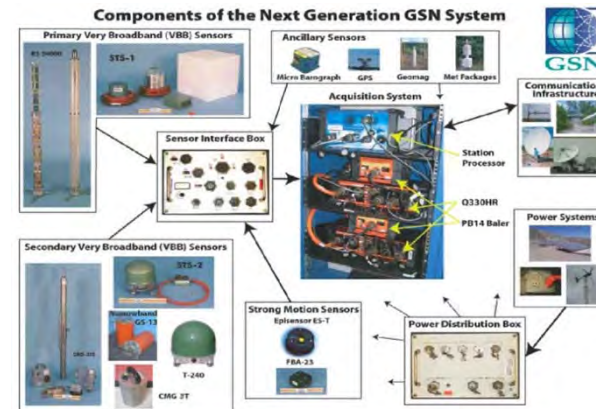
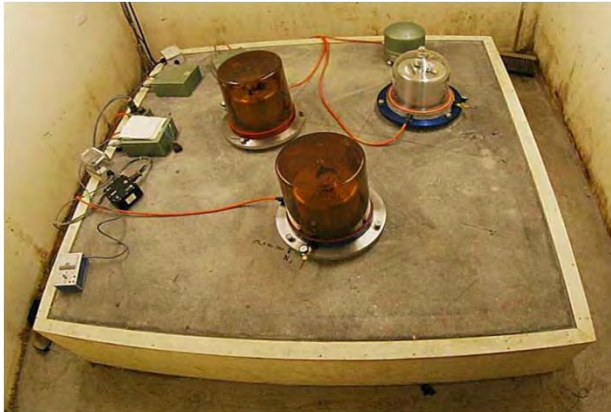
Buenos Aires, Argentina

2) AUV for seismographic purposes – NIM (China)



Global Seismographic Network consists of hundreds of observation stations worldwide and hundreds and thousands of seismometers to monitor low frequency vibration of the earth.

All of these seismometers work on low frequency down to 0.5 Hz, 0.1 Hz or even to 0.008Hz. With their help, we can get a better understanding of earthquakes worldwide on a daily basis.



The low frequency vibration transducers are widely used for e.g. monitoring earthquakes, in oil exploration and control of building vibrations. It serves for the safety of human beings and to protect our property.

Therefore, it is necessary that NMIs provide calibration capabilities at low frequencies and that the CCAUV organizes international low-frequency vibration comparisons.

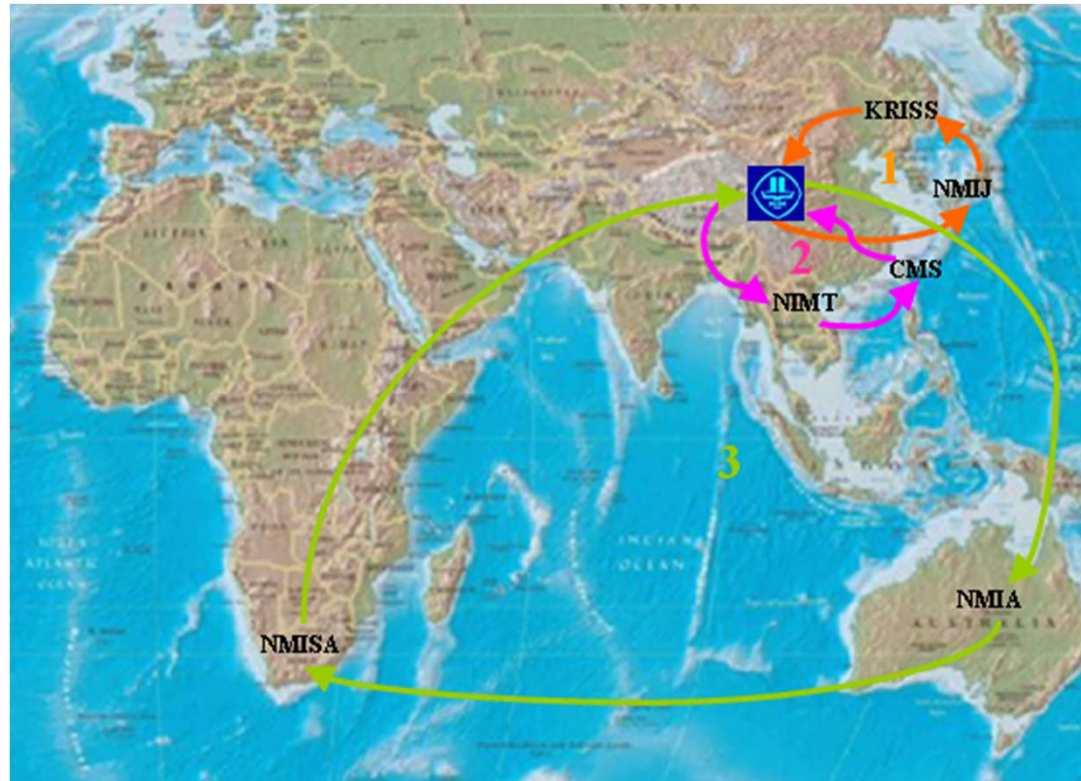


Seismometers are often large and heavy. Special low-frequency vibration calibration equipment has been developed to serve the demands from seismographic departments. For example, the ultra-low-frequency equipment at the NIM (China) is used to calibrate a seismometer at 0.008 Hz, to provide information of higher accuracy on seismic activities(cf. photo).

2008



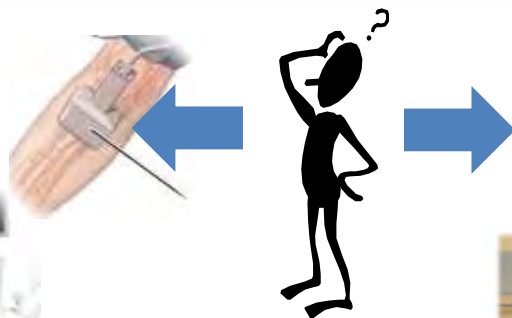
New regulations, for example on-site located advanced sensors → APMP initiative for key comparison of low vibration measurements



The on-going low-frequency vibration comparison of APMP.AUV.V-S1, piloted by NIM (China) and NMISA (South Africa), is a first action in the regional metrology organization to ensure traceability and international equivalence of vibration standards at low frequencies down to 0.1 Hz.

3) AUV for ultrasound devices for diagnostics and therapy – CENAM (Mexico)

How safe and reliable are the diagnosis and physiotherapy treatments performed using ultrasound devices?



Calibration of medical ultrasound devices?



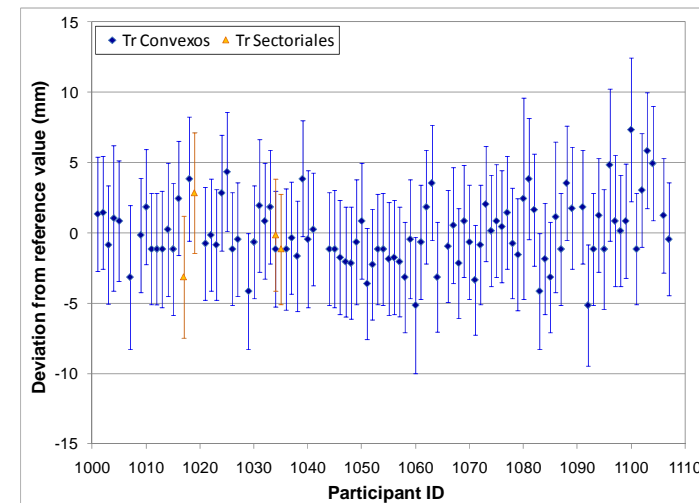
Traceability to SI units?

CENAM performed two on-site studies, comprising a sample of 198 ultrasound devices distributed in 114 health care centres located in Queretaro-Mexico, with main users in medical areas of gynecology-obstetrics and physiotherapy.

OBSERVATIONS

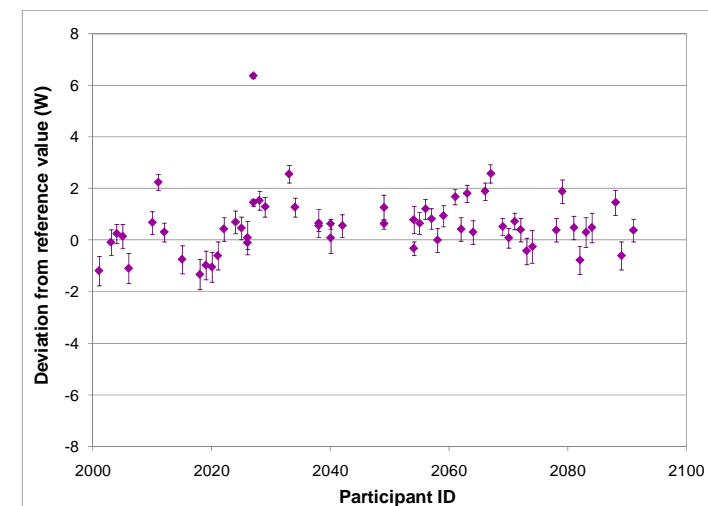
- 20 % of tested ultrasonography units may lead to false negative diagnostics in some cases;
- 25 % of the measured physiotherapy devices had larger deviations than those recommended by the IEC 61689 standard (20 % deviation generally acceptable).

Ultrasound medical imaging units



Vertical accuracy, dispersion data

Ultrasonic physiotherapy devices



Ultrasound power, dispersion data at 1.5 W/cm²

CONCLUSION

If an ultrasound device is not periodically compared to a reference standard, the effectiveness of a medical diagnostic or treatment is compromised when such equipment is used.

What is the situation at the local infrastructures for Member Economies and Associates of the CGPM concerning this matter ?

Data issued by the U.S. Food and Drug Administration indicate that thousands of ultrasound units sold in different countries may show a non-conformance operation compared to their performance specifications.

4) AUV for protecting the hearing : orchestra musicians – PTB (Germany)

- Loud: >115 dB(A) e.g. “Walküre” at the Braunschweig theater $L_{EX, 8h} = 96$ dB(A)
- Musician is a “worker”



L 42/38

EN

Official Journal of the European Union

15.2.2003

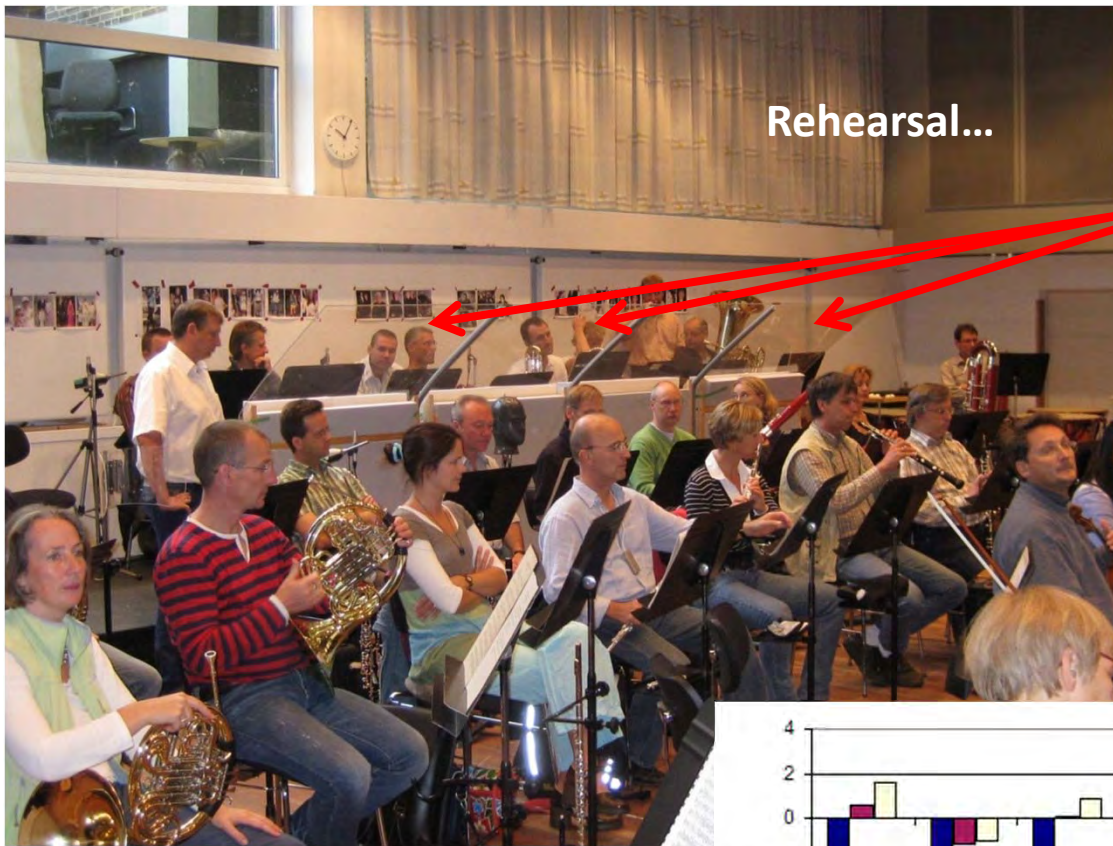
DIRECTIVE 2003/10/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 6 February 2003

on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (noise)

(Seventeenth individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC)

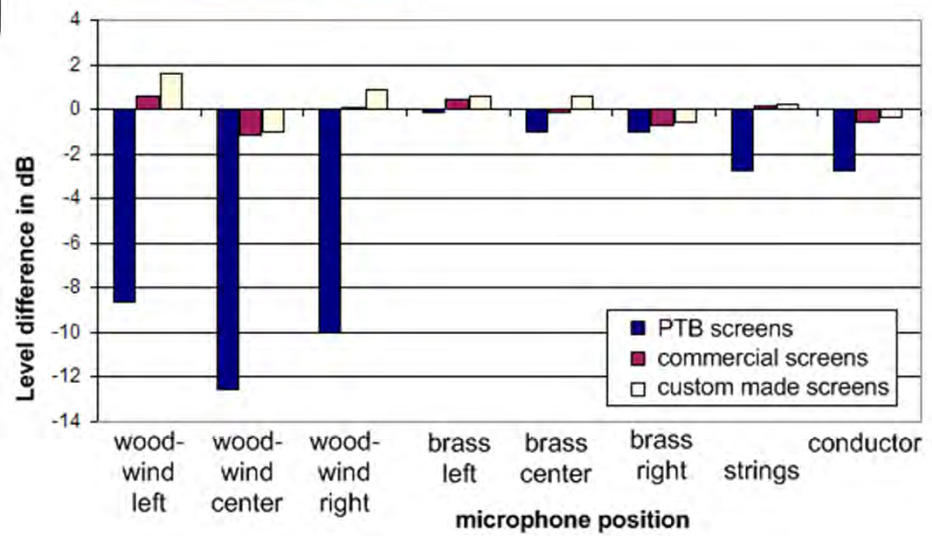
But when the noise is the goal?



Rehearsal...

Screens

Results of reduction of sound level



Links between fundamental metrology and needs in society become increasingly important.

The next CCAUV will take place in 2012.