



Consultative Committee for Acoustics, Ultrasound and Vibration

Héctor Laiz, CCAUV President

November 2022

A large, colorful graphic on the right side of the slide. It consists of multiple concentric, overlapping arcs in a rainbow spectrum (red, orange, yellow, green, blue, purple) that swirl together to form a circular shape. The arcs are of varying thickness and are set against a dark blue background.

Working together to
promote and advance
the global comparability
of measurements



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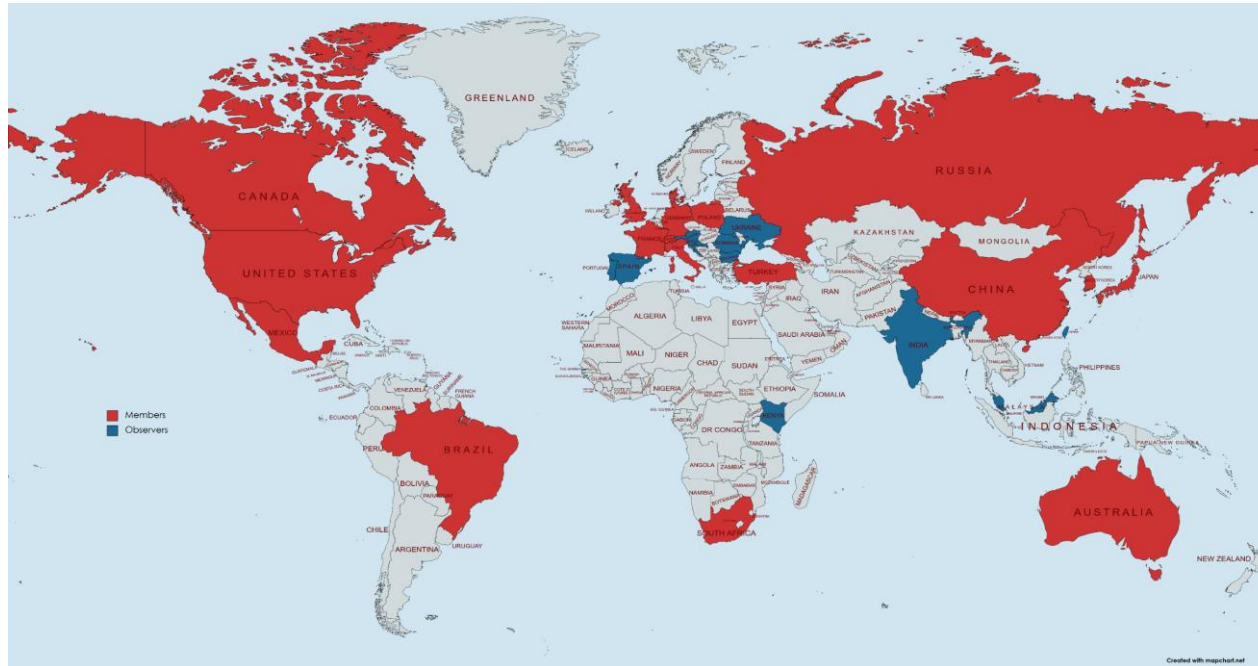
A decorative graphic on the right side of the slide consists of multiple overlapping, concentric arcs in a rainbow color palette (red, orange, yellow, green, blue, purple, magenta). The arcs are of varying thickness and are arranged in a circular pattern, creating a sense of depth and movement.

27^e réunion de la
Conférence générale
des poids et mesures

Overview

- CCAUV membership and meetings
 - New Members/Observers (Ukraine)
 - New Liaisons (CTBTO and ISO WG TC 12 and IEC TC 25)
- Global forum for progressing the state-of-the-art
 - Scientific presentations during CCAUV meetings
- Facilitating dialogue between NMIs and stakeholders
 - MoU with CTBTO
 - Joint WG ISO WG TC 12 and IEC TC 25
- Global comparability of measurements

CCAUV membership and meetings



- 18 members
- 13 observers

- International Organization for Standardization (ISO)
- International Electrotechnical Commission (IEC)
- Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO)



2021: CTBTO and Joint WG ISO/TC12 and IEC TC 25 became new liaisons

2022: Ukraine became an observer of the CCAUV



CCAUV – Working Groups

Working Group on Strategic Planning

Chair : Enver Salikoglu (UME)

Co-Chair by specialty:

Airborne Sound - Salvador Barrera Figueroa (DFM)

Vibration - Thomas Bruns (PTB)

Underwater Acoustics - Stephen Robinson (NPL)

Ultrasound - Takeyoshi Usuda (NMIJ/AIST)

Working Group for Key Comparisons

Chair: Gustavo Ripper (INMETRO)

Vice-Chair: Ryuzo Horiuchi (NMIJ/AIST)

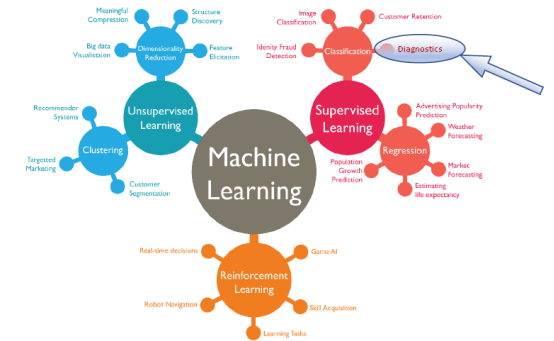
Working Group for RMO Coordination

Chair: Qiao Sun (NIM)

Global forum for progressing the state-of-the-art

Scientific presentations during the CCUAV meeting

- **Infra-AUV** (low frequency sound and vibration)
- Investigation of COVID quietening in deep **ocean noise** (CTBTO hydroacoustic stations)
- Metrological evaluation of lung ultrasound using virtual **vector machine for diagnosis** of acute respiratory distress syndrome
- Accuracy of an **optomechanical accelerometer** based on an optical frequency comb
- **Optical tachometer** calibration
- Measurement of instantaneous **acoustic pressure** using complex deconvolution of hydrophone sensitivity



CTBTO hydroacoustic stations

Facilitating dialogue between NMIs and stakeholders

There is regular dialogue between the CTBTO and CCAUV concerning infrasound and low-frequency vibration traceability of its International Monitoring System (IMS).

The International Monitoring System



PRACTICAL ARRANGEMENT
 BETWEEN
 THE INTERNATIONAL BUREAU OF WEIGHTS AND MEASURES (BIPM)
 AND
 THE PREPARATORY COMMISSION FOR THE COMPREHENSIVE NUCLEAR-TEST-BAN TREATY ORGANIZATION (CTBTO)
 ON
 COLLABORATION ON THE METROLOGICAL TRACEABILITY OF MEASUREMENTS OF INFRASOUND, SEISMIC ACTIVITY AND RADIOACTIVITY

This PRACTICAL ARRANGEMENT is made and entered into between
 the **International Bureau of Weights and Measures**, this international organization through which States Parties to the Metre Convention act together on matters related to measurement science and measurement standards, the headquarters of which is located in Sèvres, France (hereinafter referred to as the "BIPM"), duly represented by its Director, Martin Milton,
 AND
 the **Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization**, established for the purpose of carrying out the necessary preparations for the effective implementation of the Comprehensive Nuclear-Test-Ban Treaty, located in Vienna, Austria, (hereinafter referred to as the "CTBTO"), duly represented by its Executive Secretary, Lassina Zerbo,
 hereinafter referred to as the "Parties" collectively or "Party" individually.

PREAMBLE
 RECOGNIZING that the International Bureau of Weights and Measures (BIPM), established by the Metre Convention in 1875, has the mission to work with the National Metrology Institutes (NMIs) of its Member States, the Regional Metrology Organizations (RMOs) and strategic partners world-wide and to use its international and regional areas to promote and advance the global comparability of measurements for scientific discovery and innovation, industrial manufacturing and international trade, improving the quality of life and ensuring the global environment.
 RECOGNIZING that the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) was created in 1995 by a Resolution adopted by the Meeting of States Signatories at the United Nations in New York, to carry out the necessary preparations for the effective implementation of the Comprehensive Nuclear-Test-Ban Treaty (CTBT), including in particular of the Treaty's verification regime at entry into force of the Treaty.
 CONSIDERING that the International Centre for Weights and Measures (ICWM) has set up a number of Consultative Committees, which bring together the world's experts in their specialized fields as advisors on scientific and technical matters to prepare recommendations,

An MoU was signed between the BIPM and CTBTO on collaboration on the metrological traceability of measurements of infrasound, seismic activity and radioactivity.



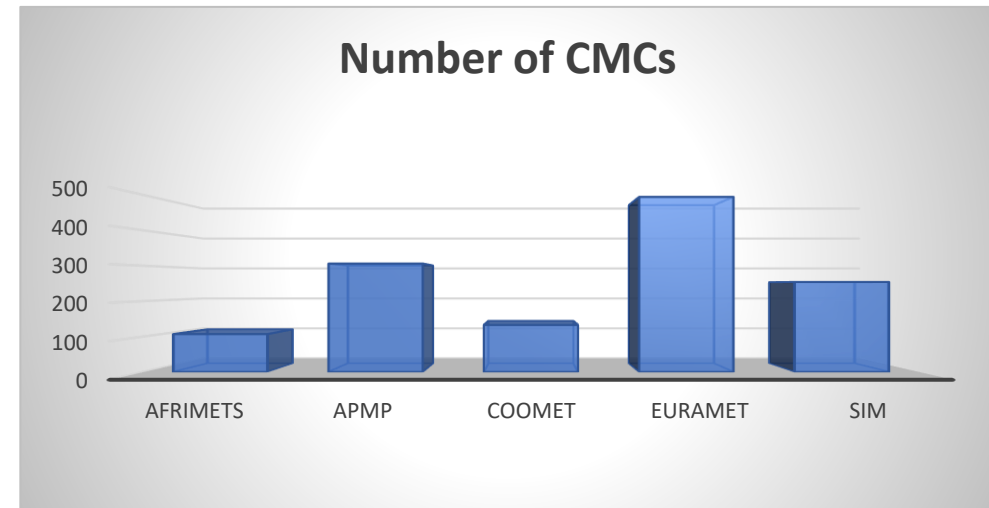
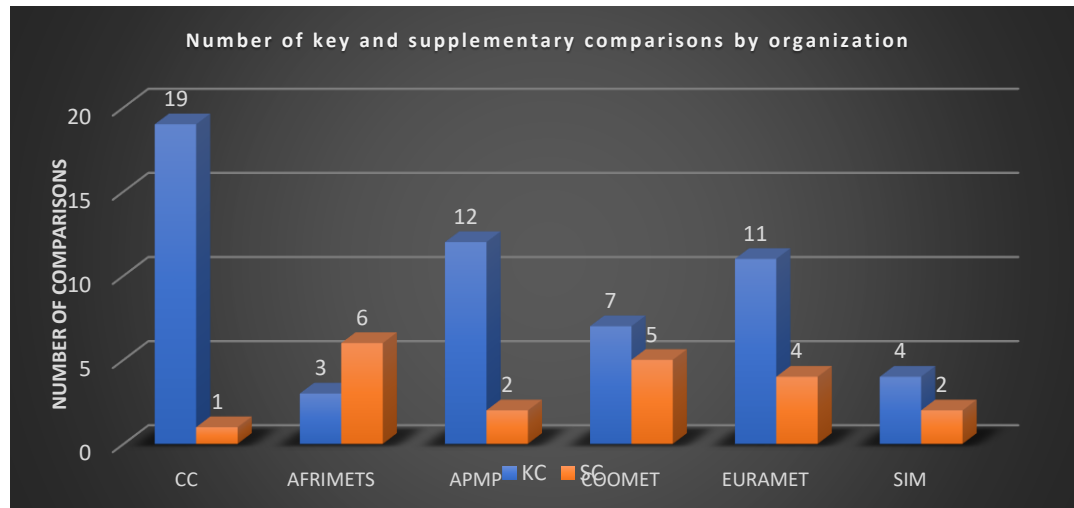
Facilitating dialogue between NMIs and stakeholders

- A liaison between the joint WG ISO/TC 12 (Quantities and units) and IEC TC 25 (Quantities and units) has been finalized.
- The liaison was already in place after the successful collaboration on the 80000 (Quantities and Units) series in 2019, which lead to a significant improvement in the Acoustics section ([CCAUV 2021 report](#))
- A member of the CCAUV represents it in the joint WG.

Global comparability of measurements

The planning process for KCs involves careful deliberation to optimize the resource requirements needed to respond to the needs of its stakeholders.

Repeat CC KCs → 10-year cycle.



Total number of CMCs: 1294

Last approved KCs (October 2022): CCAUV.A-K6 (PRIMARY PRESSURE CALIBRATION OF LABORATORY STANDARD MICROPHONES) and CCAUV.W-K2 (FREE-FIELD HYDROPHONE CALIBRATIONS IN WATER)

Progress on Strategy

The new version of the Strategic Plan document has been updated principally on areas like:

- **Food safety and Air pollution. Acoustic Spectroscopy** (determination of particle size)
- **Energy. Photoacoustic Spectroscopy** (detection of trace levels of gases)
- **Health. Lung Sonography** (pulmonary lesion)
- **Digital agenda. Test data sets for validating learning data and for an investigation of performance are required** (hydrophone sensor- digital system – digital signal process)

Outlook

The CCAUV has met twice since the 26th meeting of the CGPM (2019 and 2021). CCAUV meetings provide a global and formal forum to:

- cover cooperation via the comparisons needed for mutual recognition
- describe the latest research and demonstrate progress in the relevant fields
- create and maintain contacts with other specialists
- facilitate discussions on current issues

The meetings also provide an opportunity for scientific exchange and thematic presentations on current leading-edge AUV metrology topics.