

1. General Aspects

This report summarizes activities of the Technical Committee for Acoustics, Ultrasound and Vibration (TC AUV) since the 7th CCAUV in 2010.

All TC AUV activities are organized in the following way: general issues are within the responsibility of the Technical Committee and technical issues are handled within the three Sub-Committees (SC) covering different subject fields. The activities of each Sub-Committee are coordinated by the appointed Convenor. The membership within Sub-Committees is as follows:

SC "Acceleration and Vibration"	: 15
SC "Sound in Air"	: 16
SC "Ultrasound and Underwater Acoustics"	: 4

All in all, the TC AUV has representatives from 25 of the 38 members of EURAMET.

2. Projects

Project 792 Investigation of methods of secondary free-field calibration of working standard microphones: This project is intended to investigate the viability of different methods of secondary free-field calibration and compare the results of these methods. It also addresses the need for a suitable sound source. The driver for this work is the preparation of the next part of the IEC 61094 series of Standards on measurement microphones, to describe methods of secondary free-field calibration of working standard microphones by comparison with laboratory standard microphones. The project has been finished, and the results will be used as input for a new standard on the subject. The project will be formally closed in 2011 or early 2012, and the final reports will be uploaded to EURAMET's database.

New project proposals have been discussed, and these may be formalised in the near future. Projects that are labelled as "comparisons" are mentioned below identified by the corresponding EURAMET project number.

3. Comparisons

3.1. Key Comparisons

NMIs from EURAMET are participating in the following CCAUV comparison:

CCAUV.A-K5 "Comparison of laboratory standard microphone calibrations." This key comparison is an update of CCAUV.A-K1 but with enhanced scope. Among the participants from EURAMET there are four NMIs: DFM (DK); GUM (PL); INRIM (IT); NPL (UK); and one Designated Institute: BKSV-DPLA (DK). The measurement round is in progress. The comparison is piloted by NPL.

CCAUV.U-K3 "Ultrasonic power." This key comparison covers the measurement of the time-averaged, ultrasonic power output of an ultrasonic standard transducer. Among the participants there are four NMIs from EURAMET: INRIM (IT), NPL (UK), PTB (DE), and UME (TR).

CCAUV.U-K4 "Comparison of laboratory reference hydrophone calibrations." This key comparison is an update of CCAUV.U-K2 but with enhanced scope. The participating EURAMET NMIs are NPL (UK), and PTB (DE).

CCAUV.V-K2 “Complex charge sensitivity, measurement according to ISO 16063-11.” developments in technology and improvements at the NMIs expanded the general range of the calibration capabilities currently available. Therefore during the meeting of CCAUV in 2008 the decision was taken to make preparations for a further KC with an appropriately extended measurement range.. Among the participants from EURAMET there are 6 NMIs: CMI (CZ), GUM (PL), LNE (FR), METAS (CH); PTB (DE), UME (TR); and one Designated Institute: BKSVDPLA (DK). The measurement round is in progress. The comparison is piloted by PTB.

The following EURAMET AUV comparisons are in progress:

EURAMET.AUV.A- S1 (EURAMET project 1126). Comparison of pressure reciprocity calibration of microphones among CENAM (MX), DFM (DK), DMDM (RS), and INM (RO). The role of Pilot laboratory is undertaken by DFM and CENAM. The draft A report has been prepared by DFM, and circulated for its approval among participants.

EUROMET.AUV.V-K1.1 (EUROMET project 897). Five NMIs participate BEV (AT), INETI (PT), LNE (FR), NCM (BG) and PTB (DE). PTB is acting as the pilot of the comparison. The results have been approved, and published in the KCDB.

EURAMET.AUV.V-S1 (EURAMET project 1204). 9 NMIs participate CEM (ES), CMI (CZ), GUM (PL), INRIM (IT), LNE (FR), METAS (CH), MIKES (FI), PTB (DE), SP (SE), and one Designated Institute BKSVDPLA (DK). LNE is acting as the pilot of the comparison.

EURAMET NMIs are also involved in the following key comparison within other RMO.

COOMET.AUV.V-K1: 3 participants from EURAMET (GUM, UME, INM). VNIIM (RU) is the pilot of the comparison. The Measurement stage has been completed. The Draft A of the comparison report is under preparation.

3.2. Bilateral Comparisons

There are three bilateral comparisons underway at different stages.

EURAMET project 1062: Bilateral comparison in hydrophone calibration up to 50 MHz between NPL (UK) and PTB (DE).

EURAMET.AUV.V-K1.2 (EURAMET project 1066) is a comparison on the calibration of accelerometers between METAS (CH) and PTB (DE). This comparison has been approved for equivalence and the results published in the KCDB.

EURAMET project 1142: Bilateral Comparison of Accelerometer Calibration between MIKES (FI) and SP (SE).

4. CMCs

A total of 20 EURAMET countries have CMC entries approved and published on the BIPM KCDB. The overall number of published CMCs is 511. The distribution by country is shown in the figure below.

Two CMC submissions EURAMET.AUV.9.2010, and EURAMET.AUV.10.2011 that contain entries from NSAI-NML Ireland, and LNE, France have been through intra-, and inter-regional review. The two CMC batches were approved, and published in the KCDB.

In 2011 several batches containing CMCs from NMIs from other RMOs have been reviewed by the TC's Working Group. All these batches have been approved or the review process is underway: AFRINETS.AUV.3.2011 (approved), APMP.AUV.8.2011 (approved), APMP.AUV.9.2011 (approved), and COOMET.AUV.6.2011 (approved). Recently, a new batch from SIM has been received SIM.AUV.2.2012 for its review.

5. Activities of the Sub-Committees

The activities of each Sub-Committee are coordinated by the appointed Convenor. The level of participation in Sub-Committees varies significantly. Each Sub-Committee meets annually. The work of the Sub-Committees is reflected mostly in the many EURAMET joint projects.

6. Participation in EMRP

The TCAUV participates actively in the EMRP. There is an active JRP from the 2010 Call, and two JRP from the 2011 call had already started.

The project IND09 Dynamic (Call 2010 Industry) is concerned with the generation of the knowledge and infrastructure needed for establishing and ensuring the traceability for the mechanical quantities force, torque and pressure for measurements under dynamic conditions.

The project HLT01 Ears (Call 2011 Health II) is concerned with the metrology underpinning the development of a universal ear simulator and methods for quantifying the perception of non-audible sound.

The project HLT03 DUTy (Call 2011 Health II) is planned to start in 06/2012 deals with the challenges of establishing the metrological basis for therapeutic ultrasound.

Several PRTs for the 2012 Call were sent to the EMRP. These proposals are mostly related to the Calls for Open Excellence and SI Broader Scope.

7. Roadmapping 2012

The review of the roadmaps has started in all Sub-Committees. A consult process among members has been launched. It is the general opinion that the challenges described in the current roadmaps fit very well with the objectives of the EMPIR. Documenting the stakeholder's views is an on-going task.

8. Meetings

The TCAUV and the three Sub-Committees meet typically on a yearly basis. In 2011 the meetings of the TCAUV, the Sub-Committee for Acceleration and Vibration and the Sub-Committee for Sound in Air were held jointly on May. The meeting was hosted by the Serbian Directorate of Measures and Precious Materials (DMDM). The Sub-Committee for Ultrasound and Underwater Acoustics did not meet in 2011.

The experience of holding a joint meeting of the TC and the Sub-Committees has been positively received, and a joint meeting (possibly including also the Sub-Committee for Ultrasound and Underwater Acoustics) was planned to be held in Paris, hosted by the LNE in the week previous to the biennial meeting of the CCAUV at the BIPM in June 2012. These plans were completed satisfactorily, and the meeting took place as planned.

The coming meetings will be held in Prague (hosted by the CMI, 2013), Warsaw (hosted by GUM, 2014), and Copenhagen (hosted by DFM, 2015).

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