



## ANNUAL REPORT of COOMET TC 1.2 "Acoustics, Ultrasound, Vibration" for 2021

### 1 GENERAL FEATURES OF COOPERATION IN THE SUBJECT FIELD

Currently NMIs of 12 countries are represented in TC 1.2 "Acoustics, Ultrasound, Vibration".

#### Information about the initiative of NMIs in organizing and piloting COOMET comparisons

NMIs - initiators of comparisons	NMI – Pilot laboratory							
	BY	DE	DN	RU	UA	CN	PL	TR
BY	300/BY/04 337/BY/05 369/BY/06 434/BY/08 482/BY/09			626/BY/13				
DE		226/DE/01						
RU				308/RU/04 405/RU/07 448/RU/08 473/RU-a/09 531/RU/11 561/RU/12 706/RU-a/16 757/RU-a/18 786/RU-a/19 846/RU/21		646/RU/14		
UA		316/UA/04	323/UA/04	609/UA/13	392/UA/07 431/UA/08 535/UA/11		666/UA/15	
TR								790/TR-a/19

Coordinators of the following fields were appointed within TC 1.2:

- "Acoustics of the air medium" - being specified;
- "Acoustics of the water medium" – Dr. Aleksandr Isaev (VNIIFTRI, Russia);
- "Vibration" – Mr. Andrey Ivashchenko (Ukrmetrstandart, Ukraine).

TC members supported an initiative to appoint a coordinator of a new field "Ultrasound". Candidates for the coordinator of that field, as well as candidates for a new coordinator of the field "Acoustics in the air medium" (due to the retirement of the previous coordinator) are being discussed among TC members.

In 2021 document COOMET D5.2 "Regulation on the Technical Committee "Acoustics, Ultrasound, Vibration" (TC 1.2)" (replacing COOMET D5.2/2003) was updated – the document will be submitted to the COOMET Committee for approval in 2022.

## 2 TC MEETINGS

The scheduled 16<sup>th</sup> meeting of TC 1.2 was held online on 30 September 2021.

The main issues discussed:

- status of the current COOMET comparisons;
- prospects for the organization of new comparisons and proposals to the COOMET Program of comparisons;
- results of the 21<sup>th</sup> meetings of JCMS, information on the decisions of the COOMET Committee and Presidential Council and discussion of issues related to the decisions taken;
- on the possibility and necessity of developing standard calibration methods within the framework of the TC;
- discussion of digitalization issues in the field of metrology, relevant for the AUV field;
- consideration of issues of intra- and interregional review of CMCs on the KCDB 2.0 platform, as well as the participation of TC experts in the review of CMCs of other RMOs;
- update of the lists of technical experts for the review of CMCs and the peer review of the QMS;
- implementation of the resolutions of previous TC 1.2 meetings.

The participants of the meeting proposed to continue work on the following current COOMET comparisons:

- Pilot comparison COOMET 706/RU/16 "Pilot comparison of longitudinal ultrasonic wave propagation velocity in solid media";

- Supplementary comparison COOMET.AUV.A-S3 (COOMET project 757/RU/18 "Comparisons of national measurement standards of the sound pressure units in air in the infrasound frequency range from 0.1 to 100 Hz") and COOMET pilot comparison 786/RU/19 "Comparisons of the results of amplitude-phase calibrations of hydrophones in the frequency range from 10 kHz to 500 kHz";

- Supplementary comparison COOMET 790/TR/19 "Supplementary comparison on calibration of sound calibrators";

- Key comparison COOMET 846/RU/21 "Regional key comparisons in the field of ultrasound power measurement in water".

The participants of the meeting discussed new proposals to the COOMET Program of comparisons, namely:

- Comparison of tone audiometer calibrations. Representatives of VNIIFTRI were invited to consider the possibility of accepting the status of a pilot laboratory;

- Comparison of calibrations of ear simulators and calibrations of artificial mastoids. Interest in the projects was expressed by the NMIs of Russia, China, Turkey and Ukraine;

- Calibrations of standard microphones. The representative of VNIIFTRI (Russia) proposed comparison of calibrations of standard microphones based on the results of key comparisons CCAUV.A-K6;

- COOMET Supplementary Comparisons in the Field of Vibration based on the Results of Key Comparisons CCAUV.V-K5;

- Comparison of vibration standards in the low-frequency field. The participants of the meeting asked the representative of the NMI of China to provide information on the results of the research work carried out in the field of low-frequency vibration, after which the interested parties (China, Ukraine, Turkey and Russia) were invited to discuss the possibility of conducting COOMET comparisons in this area.

*Planned COOMET comparisons are generally linked to the CCAUV development strategy for 2019-2029.*

On the issue of updating the lists of technical experts on review of CMCs and peer review of the QMS, it was proposed to the NMIs represented in the TC to elaborate the issue of nominating

authorized technical experts whose tasks will include the preparation and review of CMCs within the framework of the KCDB 2.0 platform.

### 3 RESULTS OF THE IMPLEMENTATION OF THE COOMET STRATEGY AND COOMET DEVELOPMENT PROGRAM (concerning the activities of TC 1.2)

TC 1.2 members took part in the implementation of a number of activities provided for in the COOMET Development Program for 2020-2022 and Roadmap for the implementation of the COOMET Strategy for 2020-2025, namely:

- 9. (Ind-a.1.9) Carrying out of an analysis of the timeframe for conducting COOMET comparisons and taking corrective actions for its reduction: work was carried out on the official completion of comparisons in the KCDB performed under the auspices of TC 1.2;
- 78. Drawing up and implementation of a Plan for the preparation of COOMET Recommendations, having requirements for calibration of various groups of measuring instruments (Guide on calibration): based on the discussion that took place at the TC 1.2 meeting in 2021 it was decided that there was no need in preparing model procedures in the field of AUV.

### 4 STATUS OF COOMET PROJECTS IN THE FIELD OF "AUV"

#### Comparisons in progress

Project №	Title of the project	Project code in KCDB	Project coordinator	Status
757/RU-a/18	Comparisons of national measurement standards for the unit of sound pressure in the air in the frequency range from 0,1 to 100 Hz	Supplementary COOMET. AUV.A-S3	A. Nikolaenko VNIIFTRI, Russia	<b>Participants of the comparisons:</b> BelGIM, Belarus VNIIFTRI, Russia DP NDI "Systema", Ukraine NIM, China TÜBİTAK UME, Turkey <b>At the stage of preparation of draft A of the comparison report.</b>
786/RU-a/19	Comparisons of the results of amplitude-phase calibrations of hydrophones in the frequency range from 10 kHz to 500 kHz	pilot	Chen Yi HAARI, China	<b>Participants of the comparisons:</b> VNIIFTRI, Russia HAARI, China <b>Project approved</b>
790/TR-a/19	Calibration of sound calibrators	Supplementary COOMET.AUV. A-S4	E. Sadikoglu TÜBİTAK UME, Turkey	<b>Participants of the comparisons:</b> TÜBİTAK UME, Turkey BelGIM, Belarus VMC, Lithuania VNIIFTRI, Russia NSAI-NML, Ireland DP NDI "Systema", Ukraine SASO-NMCC, Saudi Arabia <b>At the stage of measurements</b>
846/RU/21	Regional comparisons in the field of the ultrasound power measurements in the water	key	Baki Karaboce TÜBİTAK UME, Turkey	<b>Participants of the comparisons:</b> VNIIFTRI, Russia DP NDI "Systema", Ukraine TÜBİTAK UME, Turkey NIM, China <b>Stage of preparation of technical protocol</b>

### Completed comparisons

Project №	Title of the project	Project code in KCDB	Project coordinator	Status
706/RU-a/16	Comparison of longitudinal ultrasonic wave propagation velocity in solid media	pilot	V.A. Lugovoi Far East branch of FGUP «VNIIFTRI»	<b>Participants of the comparisons:</b> BelGIM, Belarus FEB of VNIIFTRI, Russia Ukrmetrteststandard, Dneprstandartmetrologiya, Ukraine NIM, China <b>Project completed in December 2021.</b>

### Planned comparisons

Project №	Title of the project	Project code in KCDB	Project coordinator	Status
	Comparison of calibrations of tone audiometers	Supplementary comparison	VNIIFTRI, Russia	<b>Participants of the comparisons:</b> BelGIM, Belarus VNIIFTRI, Russia DP NDI "Systema", Ukraine <b>At the stage of registration</b>
	Comparison of calibration of ear simulator	Supplementary comparison		<b>Participants of the comparisons:</b> VNIIFTRI, Russia DP NDI "Systema", Ukraine TÜBİTAK UME, Turkey NIM, China <b>At the stage of discussion of the project coordinator.</b>
	Comparisons of calibrations of artificial mastoids	Supplementary comparison		<b>Participants of the comparisons:</b> VNIIFTRI, Russia DP NDI "Systema", Ukraine TÜBİTAK UME, Turkey NIM, China <b>At the stage of discussion of the project coordinator.</b>
	Calibrations of standard microphones	Regional key comparison	E. Sadikoglu TÜBİTAK UME, Turkey	<b>Participants of the comparisons:</b> VNIIFTRI, Russia DP NDI "Systema", Ukraine TÜBİTAK UME, Turkey <b>At the stage of registration</b>
	Primary calibration of the amplitude and phase of the complex sensitivity of accelerometers in the range from 10 Hz to 20 kHz	Regional key comparison		<b>Participants of the comparisons:</b> VNIIFTRI, Russia Ukrmetrteststandard, Ukraine TÜBİTAK UME, Turkey <b>At the stage of discussion of the project coordinator.</b>

## 5 STATUS OF AUV CMCs OF COOMET NMIs

Information on AUV CMCs of National Metrology Institutes, submitted through COOMET and published in the KCDB

CMC AUV	Date of publication in the KCDB	NMI	Number of published entries
COOMET.AUV.1.2001 COOMET.AUV.5.2009	2002-06-07 2009-09-18	VNIIFTRI, Russia	72
COOMET.AUV.2.2003 COOMET.AUV.7.2014 COOMET.AUV.9.2017	2004-04-07 2015-01-27 2018-01-17	BelGIM, Belarus	31
COOMET.AUV.3.2005 COOMET.AUV.4.2007 COOMET.AUV.6.2011 COOMET.AUV.7.2014 COOMET.AUV.8.2007	2005-08-31 2008-01-09 2011-10-05 2015-01-27 2017.09.21	DP NDI «Systema», Ukraine	30

## 6 PARTICIPATION OF COOMET IN INTERREGIONAL REVIEW OF CMCs

During the reporting period the TC took part in the interregional review of the following CMCs:

- CMC package of the NMI of Austria (BEV);
- CMC package of the NMI of Egypt (NIS);
- CMC package of the NMI of France (LNE).

## 7 COOPERATION WITH INTERNATIONAL AND REGIONAL ORGANIZATIONS IN THE FIELD OF AUV

In 2021-2022 the TC members have taken part in a number of international events, conferences and seminars:

- annual online meetings of WG 1 TC43 ISO “Acoustics”, WG 7, 8, 15 TC87 IEC, plenary meeting of TC87 IEC “Acoustics. Ultrasound. Vibrations”, March 15-17, 2021, January 2022;
- webinar of the Ministry of Economy of Ukraine with the support of the German Partnership for International Cooperation (GIZ) “Modern standardization of Ukraine: role and significance in the context of signing the ACAA Agreement”, May 13, 2021;
- online seminar dedicated to the 30th anniversary of COOMET, June 15, 2021;
- online webinar on the technology transfer of medical metrology for the public health service system, under the cooperation in science, technology and innovation between Thailand and China, 12 July 2021;
- Online seminar "Practice of application of CIPM MRA documents and COOMET publications on conducting and evaluating the results of calibrations and comparisons", October 15, 2021;
- Meeting (video conference) of TC 29 of the International Electrotechnical Commission and meetings of the working groups “5. Measuring microphones”, “Audiometric equipment” and “Acoustic calibrators”, October 11-21, 2021;
- PTB online training on Internal Audit in accordance with the requirements of ISO/IEC 17025:2017 and other relevant international documents (BIPM, ILAC, EA), November 15-19, 2021;
- 13th meeting (videoconference) of the Consultative Committee for Acoustics, Ultrasound and Vibration (CCAUV) at the BIPM, November 16-18, 2021;
- 18th International Scientific and Technical Seminar “Measurement Uncertainty: Scientific, Applied, Regulatory and Methodological Aspects” (UM-2021), HNURE, Ukraine, November 30, 2021;
- Meeting (video conference): "TAIEX Expert Mission on Pre-assessment mission to assess the readiness of the Ukrainian system to start the negotiation of the ACAA (Metrology)": January 19-20, 2022;
- BIPM online course "KCDB 2.0 - Online technical exchanges on comparisons", February 8, 2022.

## 8 PROSPECTS

1. Creation and upgrading of national measurement standards;
2. Planned and current comparisons;
3. Expanding cooperation with technical committees of other regional metrological organizations;
4. Publication of CMCs based on the results of key comparisons of CCAUV and COOMET.

### Participation of COOMET NMIs in key comparisons of CCAUV

Acoustics Sound in air	Acoustics Sound in water	Ultrasound	Vibration
◆ CCAUV.A-K1 ◆ CCAUV.A-K2 ◆ CCAUV.A-K3 CCAUV.A-K4 ◆ CCAUV.A-K5 ◆ CCAUV.A-K6	◆ CCAUV.W-K1 ◆ CCAUV.W-K2	◆ CCAUV.U-K1 CCAUV.U-K2 ◆ CCAUV.U-K3 CCAUV.U-K4	◆ CCAU.V-K1 ◆ CCAU.V-K2 ◆ CCAU.V-K3 ◆ CCAU.V-K4 ◆ CCAU.V-K5

◆ COOMET NMIs have taken/are taking part in the CCAUV comparisons

## 9 INFORMATION ON THE EXPECTED VENUE AND DATE OF THE NEXT MEETING OF TC 1.2

It is assumed that the next meeting of the TC will be held in September 2022. The final decision on the date and format of the meeting will be made depending on the current situation.

## 10 PROPOSALS TO RESOLUTIONS OF THE COOMET COMMITTEE

➤ To approve updated document COOMET D5.2 "Regulation on the Technical Committee "Acoustics, Ultrasound, Vibration" (TC 1.2)" (replacing COOMET D5.2/2003) – Annex 1.

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TC 1.2 Acting Chair

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