COOMET activity in the field of measurements of thermophysical quantities
2017 -2020

A.I.Pokhodun

COOMET TC 1.10


Germany
Cuba
Bulgaria
China
Bosnia and Herzegovina
Belarus
Georgia
Azerbaijan
DPR of Korea
Armenia
COOMET
Kazakhstan
Turkey,
Kyrgyzia
Lithuania
Uzbekistan
Moldova
Ukraine
Romania
Tajikistan

The main activities of the Technical Committee TC1.10 of COOMET in 2017-2020

1. Practical implementation of the “Agreement on mutual recognition of national measurement standards and certificates of calibration and measurements issued by national metrological institutes:

- control of the equivalence of COOMET national measurement standards used for regional key comparisons;
- organizing and conducting regional key comparisons;
- achieving international recognition of the measuring capabilities of the NMIs of the COOMET member countries.

2. Research aimed at creating new national standards for units of thermophysical quantities and improving existing standards.

3. Research aimed at introducing a new definition of kelvin into measurement practice in COOMET countries.

On the equivalence of national measurement standards

At present, VNIIM is the only national COOMET institute that organizes regional key comparisons to assess the equivalence of national standards of temperature units. Information on the equivalence of the VNIIM measurement standard is the basis for assessing the equivalence of measurement standards used by the participants in COOMET comparisons.

More than 18 years have passed since the start of the CCT-K3 key comparisons. The CCT-K9 comparisons, started in 2011, are still ongoing. The results of the CCT-K9 comparisons are not up-to-date and will partly become questionable, since some measurements were made more than 8 years ago. Since then, the composition of the specialists who perform measurements in the experimental laboratory and some other laboratories participating in these comparisons has changed.

Taking into account the ability of PTB to monitor the current state of its reference standard based on the results of EURAMET comparisons, VNIIM asked PTB to conduct bilateral comparisons to assess the stability of the VNIIM standard. VNIIM received the consent of PTB to conduct bilateral comparisons to assess the stability of the VNIIM standard. On behalf of the COOMET TC 1.10 Technical Committee, I would like to thank PTB and in particular Steffen Rudtch for their understanding and great help in solving the COOMET problem.

Долговременная стабильность эквивалентности эталонов единицы температуры UC (NPL) и России (ВНИИМ)

Name of comparison	Results Published	Fixed point	Difference $t_{NPL} - t_{VNIIM}$, mK
An intercomparison between fixed-point cells made at VNIIM (USSR) and NPL (UC) for the realization of the melting and triple points of gallium and the solidification points of indium and cadmium	1987	Ga (Triple point)	-0,19
		Ga (Melting point)	-0,16
		In (Solidification points)	0.39
		Cd (Solidification points)	-0.07

Долговременная стабильность эквивалентности эталонов единицы температуры Германии (ПТБ) и России (ВНИИМ)

Fixed point	Difference $t_{PTB} - t_{VNIIM}$, mK	
	CCT- KC3 Results Published in 2002	CCT- K9.1 Results Published in 2020
Ga	-0.22	-0,02
In	-1.21	0,55
Sn	-0.04	0,55
Zn	1.27	0,44

Organization and execution of key and supplementary comparisons

1.**COOMET.T-K9.1** “Implementation of ITS-90 at point 234.3156 K (triple point of mercury)”. Participants: Russia, Belarus, Moldova, Kazakhstan, Georgia, Germany, Bosnia and Herzegovina.

In progress.

2. COOMET.T-K3.3 "Implementation of ITS-90 in the range from 273.16 to 933.473 K." Participants: Russia, Belarus, Kazakhstan, Moldova, Ukraine and Georgia.

The comparisons have been completed. The report has been published.

3. COOMET.-S2 "Calibration of industrial platinum resistance thermometers in thermostats". Participants: Azerbaijan, Moldova, Georgia, Bosnia and Herzegovina, Kazakhstan, Turkey.

The comparisons have been completed. The report has been published.

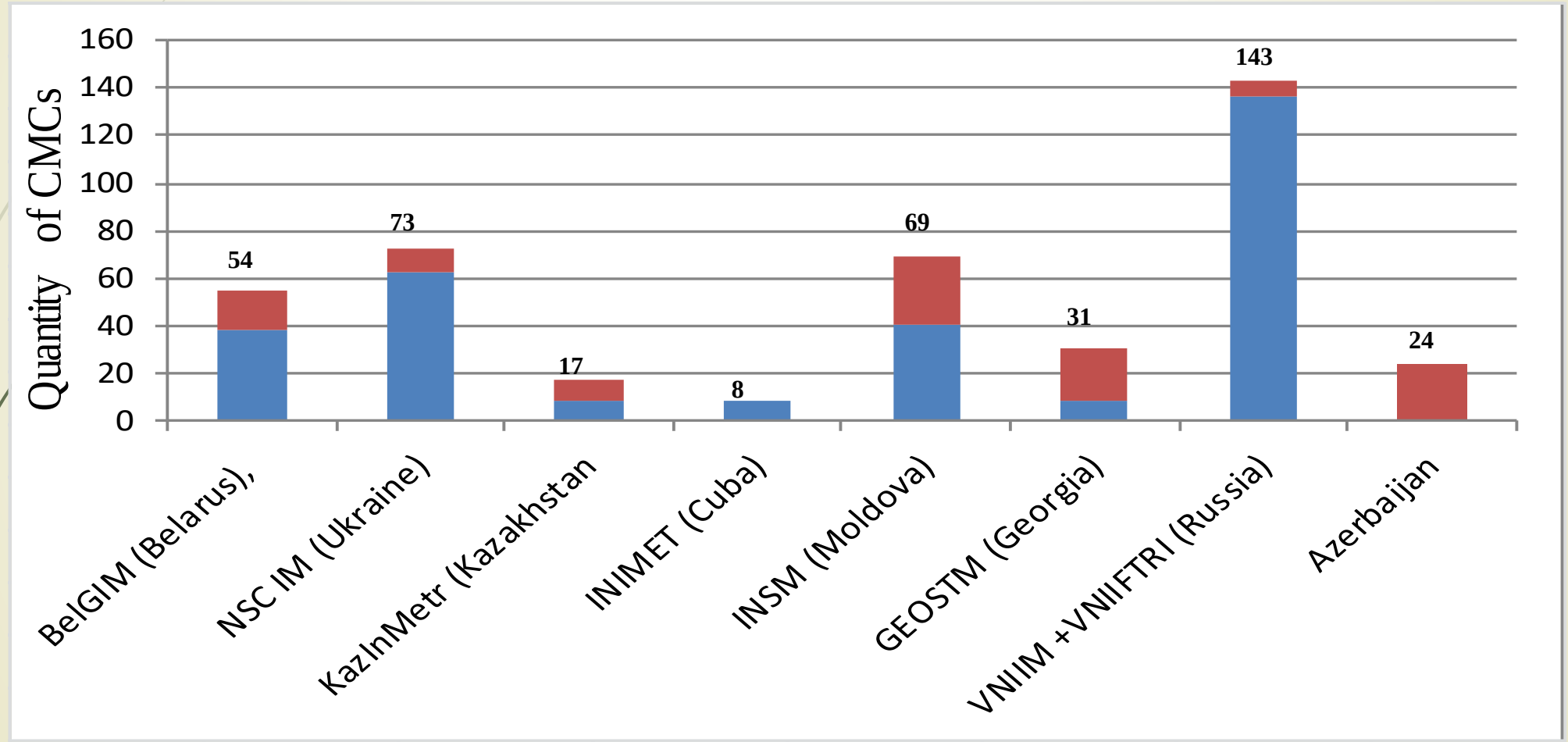
4. COOMET.T-S3. "Intercomparison of NPL and GEOSTM measurements of relative humidity from 30% to 90% at 23 ° C". Participants: Georgia, Great Britain.

The comparisons have been completed. The report has been published.

5. COOMET 744 / RU / 18 "Comparisons in the field of measuring the calorific value of coal with different sulfur content". Participants: Russia, Belarus, Germany, Turkey, China.

In progress.

Динамика развития измерительных возможностей метрологических институтов КООМЕТ в период с 2017 по 2020 гг.



PROJECT № 744/RU-a/18 (COOMET.T-S4)

COOMET COMPARISONS IN THE FIELD OF BOMB CALORIMETRY:

Comparisons in the field of measurements of combustion energy of coals with different sulphur content

3 coal samples with different total sulfur content

RUSSIA (VNIIM) - pilot
GERMANY (PTB)
ROMANIA (BRLM-INM)
TURKEY (UME)
BELARUS (BelGIM)
CHINA (NIM)

PROGRESS

TECHNICAL PROTOCOL
✓ Approved by the participants

SAMPLES:
✓ Preparation and evaluation of homogeneity and stability
✓ Shipping

CURRENT STATE:
Measurement of the samples by the participants
Preparation and sending of the measurement reports to VNIIM

4 out of 6 measurement reports were received

Research aimed at creating new national standards of units thermophysical quantities and improvement of existing standards

PROJECT № 780/RU/19

COOMET COMPARISONS IN THE FIELD OF GAS CALORIMETRY:

Comparisons of national reference gas calorimeters using samples of gas mixtures

Gas mixtures:

H_2: (10,0 ± 0,5)
CH_4: balance

CO_2: (40,0 ± 0,5)
CH_4: balance

RUSSIA (VNIIM) - pilot
GERMANY (PTB)
FRANCE (LNE)
TURKEY (UME)

VNIIM D.I. Mendeleyev Institute for Metrology

PTB

TÜBİTAK UME

LNE Le progrès, une passion à partager

PROGRESS

TECHNICAL PROTOCOL
✓ Approved by the participants

SAMPLES:
✓ Preparation and evaluation of homogeneity and stability

CURRENT STATE:

Samples ready for shipment and customs clearance

The new definition of Kelvin

RUSSIA

At VNIIM, the creation of a standard for the unit of temperature has been completed, which makes it possible to reproduce the kelvin by the method of primary thermometry and by the method of conditionally primary thermometry in the range from 961.78 ° C to 3200 ° C.

At VNIIFTRI, the creation of a standard for the unit of temperature has been completed, which makes it possible to reproduce kelvin by the method of primary thermometry in the range from 5 K to 273.16 K and by the method of conditionally primary thermometry in the range from 4,8 K to 273.16 K. 273.16 K .

UKRAINE

At the NSC "Institute of Metrology", work is underway to create a standard for the unit of temperature, which will allow reproducing kelvin by the method of conditional primary thermometry in the range above 961.78 ° C.

BELARUS

BelGIM is studying the possibility of creating a standard that implements a new definition of kelvin.

MOLDOVA, UZBEKISTAN, KAZAKHSTAN, KYRGYZSTAN

They reported that there is no need in their countries at this time to have standards implementing the new definition of Kelvin.

Memorandum of Understanding

Between

The European Association of National Metrology Institutes, EURAMET e.V., (in the following referred to as "EURAMET"), represented by the EURAMET Chairperson,

and

The Euro-Asian Cooperation of National Metrology Institutions (in the following referred to as "COOMET"), represented by the COOMET President,

Done in two copies,

Date: 12.04.2018

EURAMET

.....

Dr Beat Jeckelmann

Date: 12.04.2018

COOMET

.....

Dr. Valery Hurevich

Cooperation of technical committees EURAMET TST and COOMET T1.10

1. Participation of the Chairman of the COOMET Technical Committee TC 1.10 in the EURAMET TCT meeting (April, 2018, Boras)

2. Participation of the Chairman of the COOMET Technical Committee TC 1.10 in the EURAMET TCT meeting (April 2019, Torino)

3. Participation of the Chairman of the EURAMET TCT Technical Committee Dr. Dolores del Campo at the meeting of COOMET TC 1.10 (August, 2019, Irkutsk)

4. Decision to hold a joint meeting of COOMET Technical Committees TC1.10 and EURAMET TCT (2019)

5. Meeting of the Chairmen of COOMET TC1.10 and EURAMET TCT technical committees dedicated to the preparation of a joint meeting of technical committees (February 2020, Bratislava)

6. EURAMET and COOMET are collaborating to develop guidelines for the calibration of thermometers for measuring surface temperature and calibrating radiation thermometers.

Thank you
for attention