ANNUAL REPORT
of TC 1.11 "Time and Frequency" for 2022

1. GENERAL CHARACTERSTICS OF COOPERATION IN THIS SUBJECT FIELD, INCLUDING INFORMATION ON THE IMPLEMENTATION OF THE COOMET STRATEGY AND THE COOMET DEVELOPMENT PROGRAM

TC 1.11 includes representatives of 17 COOMET member countries: Azerbaijan, Armenia, Belarus, Bulgaria, Bosnia and Herzegovina, Germany, Georgia, Kazakhstan, Kyrgyzstan, Lithuania, Moldova, Russia, Slovakia, Tajikistan, Turkey, Uzbekistan and Ukraine.

Note – in October 2022 a notification was received from the Ministry of Economy of Ukraine of the suspension of participation in CSBs; in December 2022 a notification was received from the Ministry of the Economy and Innovation of the Republic of Lithuania of the termination of participation of Lithuanian institutes in COOMET.

COOMET TC 1.11 coordinates work among COOMET member countries in the field of time and frequency, carried out at the regional level and representing common interests in this field.

In 2022, document COOMET D5.11 "Regulation on the Technical Committee "Time and Frequency" (TC 1.11)" was updated (replacing COOMET D5.11/2006) - the document was approved at the COOMET Committee in 2022.

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

• **19. (Ind-a.4.1)** Preparation and implementation of a Roadmap for TC 1.2 – TC 1.11 for implementation of decisions related to the redefinition of the SI base units: work continues on the planned activities of program COOMET P6/2021 in the area of responsibility TC 1.11.

2. RESULTS OF TC 1.11 MEETING

No TC 1.11 meeting was held in 2022.

The 15th online meeting of COOMET TC 1.11 "Time and Frequency" was held on January 19, 2023, using the Zoom platform.

The meeting was attended by representatives of 8 COOMET countries: Azerbaijan, Armenia, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia, and Uzbekistan, as well as invited specialists.

Major decisions made:

1) To ask the members of TC 1.11 to study the changes in the COOMET Memorandum of Understanding (COOMET D1/2022).

2) To take note of the information on the decisions of the 21st and 22nd meetings of the COOMET Joint Committee for Measurement Standards and be guided by them when performing work within TC 1.11.

3) The TC Chair should submit to the Joint Committee for Measurement Standards proposals for updating the COOMET Roadmap on the issue of redefining the second until 01.02.2023.

4) To approve additional comparisons of the time scales of the laboratories of Uzbekistan and Turkey, pilot - TUBITAK UME. To ask the coordinator to send to the COOMET Secretariat the form of the proposed project.

5) Until March 1, 2023, to update the lists of technical experts and candidates for technical experts on CMC review and peer review of QMS in the field of time and frequency measurement.

6) To take note of the information from the Head of COOMET Secretariat on the capabilities of the BIPM e-learning platform. The TC Chair should organize the creation of a training course on the issues of time and frequency measurements. To present the results at the next TC meeting.

7) To cancel the following COOMET publications in the field "Time and frequency":

– Recommendation COOMET R/TF/2:1995 "Interstate Hierarchical Chain for Time and Frequency Measuring Instruments";

– Recommendation COOMET R/TF/3:1995 “Requirements to Time and Frequency Measuring Equipment Produced by the COOMET Member Countries Required for Mutual Recognition of the Results of National Metrological Verifications and Certifications".

Election of a new TC 1.11 Chair took place at the meeting: TC members supported the candidacy of Igor Norets (Head of Department, scientist custodian of the national standard of Time and Frequency of the Russian Federation, VNIFTRI, Russia). The voting results were endorsed by the COOMET Presidential Council and are submitted for approval to the COOMET Committee.

3. STATUS OF COOMET PROJECTS

During the reporting period, the following COOMET projects have been implemented:

1) **project 398/RU-a/07 «Key comparisons of national standards of time and frequency with the Russian UTC (SU) scale»**

Coordinator: FSUE VNIIFTRI, Russia.

Partners: BelGIM, Republic of Belarus; RSE "KazStandard" (Nur-Sultan, Almaty), Kazakhstan; NSC "Institute of Metrology", Ukraine

The results of the comparisons of the Russian national time scale UTC (SU) with the time scales of China (NTSC) and the United States (USNO) (with regard to UTC) are given in Fig. 1.

The results of the comparisons of the national time scales of Ukraine, Kazakhstan and Belarus with regard to the national time scale of Russia UTC (SU) are given in Fig. 2.

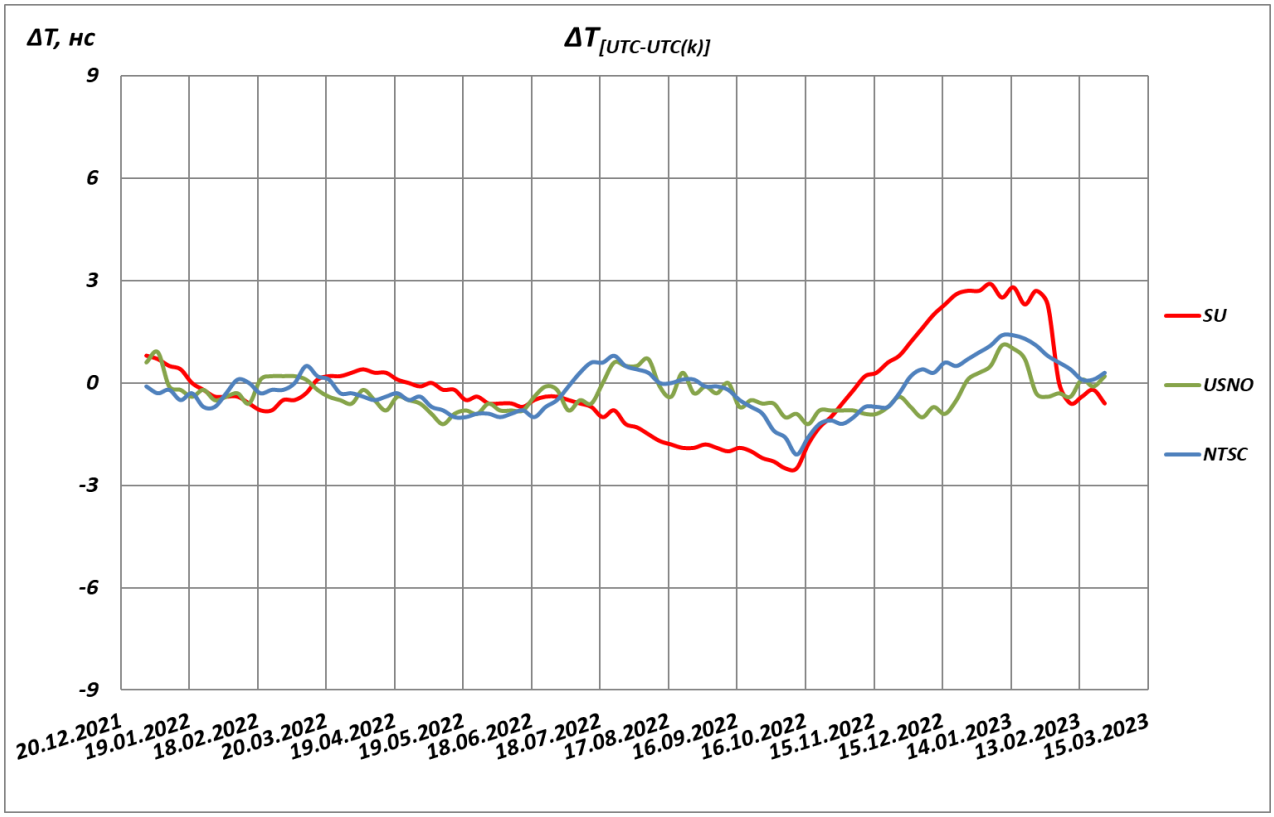


Figure 1. Results of the comparisons of the time scales of Russia, China and the USA.

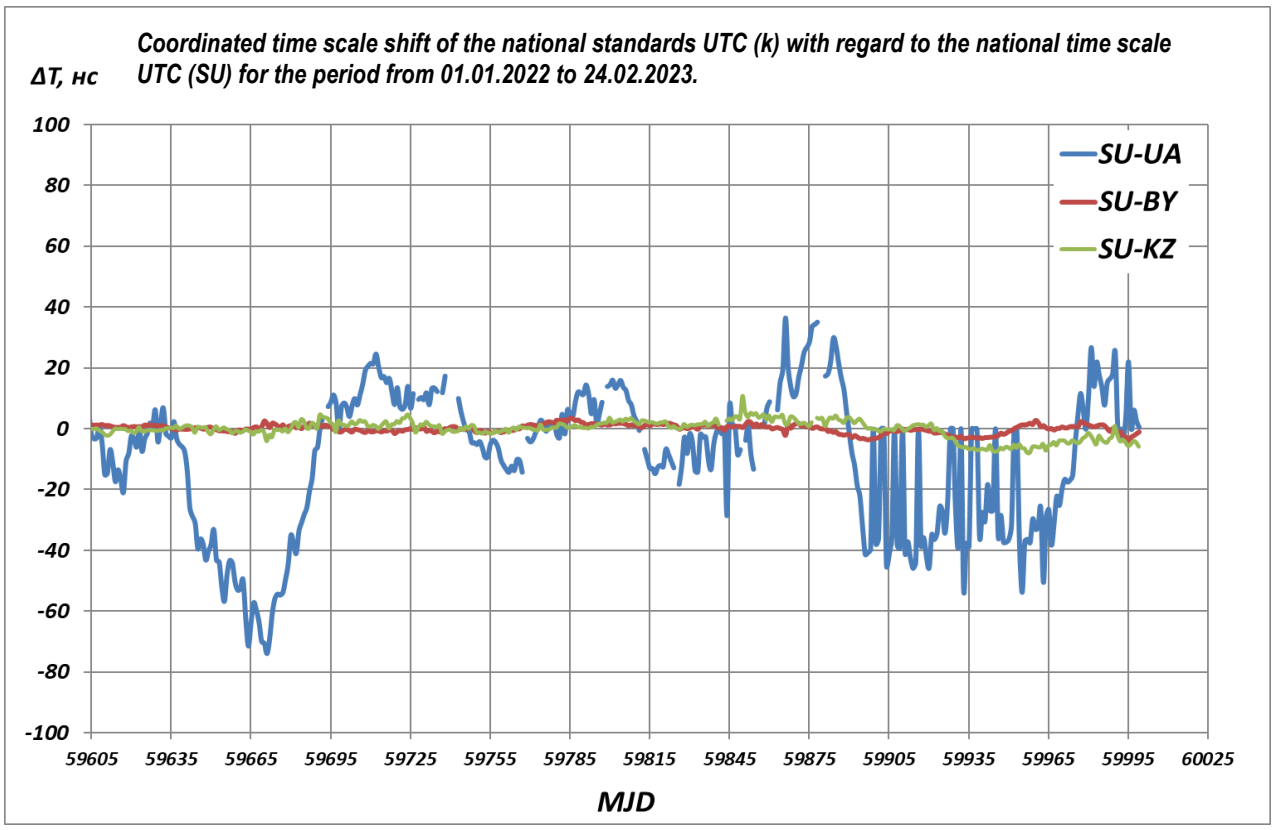


Figure 2. Results of the comparisons of the national time scales of Belarus, Russia, Ukraine and Kazakhstan.

2) project 605/RU/13 "Comparison of time scales of NTP-servers via INTERNET" has been COMPLETED.

Coordinator: FSUE VNIIFTRI, Russia.

Partners: BelGIM, Republic of Belarus; RSE "KazStandard" (Nur-Sultan, Almaty), Kazakhstan; NSC "Institute of Metrology", Ukraine; VMT/FTMC, Lithuania, TUBITAK UME, Turkey, Institute of Metrology (Bosnia and Herzegovina).

4. PARTICIPATION IN THE IMPLEMENTATION OF THE ARRANGEMENT ON MUTUAL RECOGNITION OF NATIONAL MEASUREMENT STANDARDS

4.1 Progress with CMCs of COOMET NMIs/DIs in the field "Time and Frequency"

Currently there are no CMC entries of COOMET NMIs/DIs under review.

4.2 COOMET participation in interregional review of CMCs of other RMOs:

In 2022 interregional reviews of CMC entries were not conducted for technical reasons.

4.3 TC members took part in the webinar "National time scales, calibration of comparison tools" (January 19, 2023).

4.4 The lists of COOMET technical experts on CMC review and on peer review of the QMS of NMIs/DIs have been updated.

5. COLLABORATION WITH INTERNATIONAL AND REGIONAL ORGANIZATIONS

International Bureau of Weights and Measures (BIPM)	- regular data exchange to contribute to the TAI;
Consultative Committee for Time and Frequency (CCTF),	- participation in the work of the CCTF and its Working Groups;

Consultative Committee for Length (CCL)	-	participation in elaboration of recommendations on redefinition of a second;
International Telecommunication Union (ITU)	-	participation in the work of 7A Group;
International Earth Rotation Service (IERS)	-	regular data exchange;
International Geodetic Service (IGS)	-	observation and processed data exchange;
International Laser Ranging Service (ILRS)	-	observation and processed data exchange.

6. DATE AND VENUE OF THE NEXT TC 1.11 MEETING

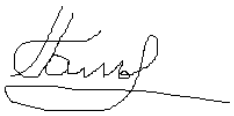
The venue and date of the 16th meeting of TC 1.11 "Time and Frequency" are currently being specified (tentative timeframe - October 2023).

7. PROPOSALS TO THE RESOLUTIONS OF THE COOMET COMMITTEE

- To approve Igor Norets (VNIIFTRI, Russia) as the TC 1.11 Chair for 4 years.
- To cancel COOMET recommendations:

– Recommendation COOMET R/TF/2:1995 "Interstate Hierarchical Chain for Time and Frequency Measuring Instruments";

– Recommendation COOMET R/TF/3:1995 “Requirements to Time and Frequency Measuring Equipment Produced by the COOMET Member Countries Required for Mutual Recognition of the Results of National Metrological Verifications and Certifications".

Vitaly Palchikov

TC 1.11 Chair