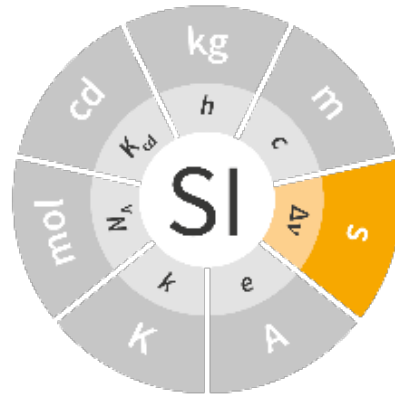


BIPM UTC Summer School



UTC(k) realization and dissemination

Sheroz Ismatullaev, Head of Department at UzNIM

Lyubov Borisovna, Chief specialist at TFL of UzNIM

Vohobjon Nishonov, Chief specialist at TFL of UzNIM

9-11 September 2025, BIPM, Sèvres France



1. BIPM recommendation and requirements for UTC(k) realization and dissemination
2. UTC(UZ) realization (personal, infrastructure, technical base)
3. UTC(UZ) dissemination

CCTF WGMRA Guideline 8 (June 2017)

Technical requirements for the time laboratories for the participation in UTC

- the designation “k” in UTC(k) refers only to those institutes that participate in the formation of **TAI**.
- realizing local time scale UTC(k) offset should be smaller than **100 ns** with respect to UTC.

Laboratories willing to participate in the calculation of UTC **should be equipped** of

1. one or more **atomic clocks**;
2. instruments to allow **remote clock comparisons**.

Clocks participating in UTC are linked at present by time transfer with:

- GNSS receivers. These receivers can be, starting from the most performing:
- Multi-channel, dual frequency
- Multi-channel, single frequency
- Two-way satellite time and frequency transfer (TWSTFT) stations.

CCTF WGMRA Guideline 6 (August 2017)

Requirements for participation in the computation of UTC at the BIPM

1) *Administrative requirements*

The requesting party (Institute or Organization) should send by e-mail to the Director of the BIPM Time Department:

- a **letter** of application requesting participation in UTC, including
 - a **description** of the time laboratory equipment;
 - the **contact details** of the recommended contact person; and any additional documents listed below.

2) *Technical requirements*

- a) The Institute/Organization must **operate time facilities adequately** equipped for contributing to UTC.
- b) The Institute/Organization must **have the capacity to submit data** to the BIPM on a continuous basis.
- c) The BIPM Time Department will evaluate the data submitted over a **trial period of approximately three months** before taking the decision to include (or not) the Institute in the calculation of UTC.

UZBEKISTAN - ASSOCIATE MEMBER OF CGPM

On July 13, 2018
Uzbekistan became
an associate member
of the General
Conference
on Weights
and Measures



Associate: Uzbekistan

General info.

CIPM MRA

Quality infrastructure

CBKT

→ The Republic of Uzbekistan became an Associate of the CGPM on 13 July 2018.

UZNIM - SIGNER OF CIPM MRA

On November 12, 2018, in Sevres (France), on behalf of the
Uzbek National Institute of Metrology, the Arrangement on Mutual
Recognition of National Measuring Standards and Calibration and
Measurement Certificates issued by National Metrology Institutes
(CIPM MRA) was signed.

Bureau
International des
Poids et
Mesures

N/Ref. Note Verbal n° MIA-CFA-2018-8

Ambassade d'Ouzbékistan
22 rue d'Aguesseau
75008 Paris

Le Bureau international des poids et mesures (BIPM) présente ses compliments à la République d'Ouzbékistan en France et a l'honneur de se référer à la Note verbale n° MIA-CFA-2018-8, notifiant la décision de la République d'Ouzbékistan de devenir État associé à la CGPM en 2018.

Il est à noter que le BIPM a reçu ce jour le règlement de 11 980 euros, correspondant à la cotisation annuelle de la République d'Ouzbékistan, la procédure pour devenir État associé est désormais achevée et la République d'Ouzbékistan est Associée à la CGPM. M. Abdukhamid KARIMOV, directeur général de l'Uzstandard Agency, a été reçu au Bureau international des poids et mesures afin de visiter le siège du BIPM et d'obtenir la reconnaissance mutuelle du CIPM (CIPM MRA).

Le Bureau international des poids et mesures saisit cette occasion pour renouveler à la République fédérale démocratique d'Éthiopie en France les assurances de sa participation.

Sèvres, 13 juillet 2018



Abdukhamid KARIMOV, directeur général, Uzstandard Agency

Reconnaissance mutuelle
des étalons nationaux de mesure
et des certificats d'étalonnage et de mesurage
émis par les laboratoires nationaux de métrologie
Paris, le 14 octobre 1999
[Supplément technique révisé en octobre 2003 \(pages 17-20\)](#)

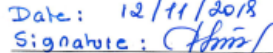


Mutual recognition
of national measurement standards
and of calibration and measurement certificates
issued by national metrology institutes
Paris, 14 October 1999
[Technical Supplement revised in October 2003 \(pages 38-41\)](#)

Comité international des poids et mesures

Bureau
international
des poids
et mesures

Organisation
intergouvernementale
de la Convention
du Mètre

Nom/Name	LNM/NMI*	État ou entité économique associée(e) à la CGPM/Associate State or Economy of the CGPM	BIPM
Signature		UZBEKISTAN	Signature
On behalf of the Uzbek National Institute of Metrology			
SATTAROV Dilhod			
Director General of the Uzbek Agency for Standardization, Metrology and Certification			
Date: 12/11/2018			
Signature: 			

*Tous les laboratoires et instituts mentionnés dans cette colonne participent à cet arrangement.
This arrangement covers all the institutes listed here.

UZNIM AND REGIONAL METROLOGY ORGANIZATIONS

May
2004

КОOMET
МЕМОРАНДУМ О СОТРУДНИЧЕСТВЕ

ПОДПИСАНО 27 мая 2004 г.

РЕСПУБЛИКА УЗБЕКИСТАН

Узбекское агентство стандартизации, метрологии и сертификации
(Агентство "Узстандарт")

Подпись: Ортаголи Хакимов
Директор Центра Национальных эталонов
Республики Узбекистан

*Full Member
in COOMET*

April
2019



SIGNATORY TO THE ASIA-PACIFIC METROLOGY PROGRAMME

MEMORANDUM OF UNDERSTANDING

The member economies of the Asia-Pacific Metrology Programme (APMP) have unanimously approved the organisation below to join APMP.

This Memorandum of Understanding is being signed by the said organisation, to indicate their acceptance of membership of APMP in the relevant membership category, and the terms of APMP's Memorandum of Understanding (MoU).

By signing this MoU, the parties acknowledge their in-principle non-binding intentions and that no legally binding obligations are intended to arise between them as a result of signing this document.

The new member organisation will work co-operatively with the other member economies of APMP and strive to achieve the objectives stated in the MoU, to the best of their ability.

Organisation: Uzbek National Institute of Metrology (UzNIM)

Economy: Republic of Uzbekistan

Membership Category: Associate Member

Name and Title of Signatory: Lazizbek Saidoripov

Deputy Director

Signature:

Date:



New Member of APMP



Dr. Takatsuji and Mr. Lazizbek Saidoripov

According to the result of voting on the membership application from the Uzbek National Institute of Metrology (UzNIM), Republic of Uzbekistan, Mr. Lazizbek Saidoripov, Deputy Director, UzNIM signed on the APMP MoU on the occasion of the COOMET Committee meeting in Dresden, Germany in April 2019. UzNIM is also a member of COOMET and became an Associate of CGPM in 2018.

www.apmpweb.org, Issue 42Q APMP Newsletter

- 2022 → UzNIM participates in **GULFMET**, as an observer in some TCs
- 2024 → in **SIM**, as a partner in comparisons
- 2025 → Associate Member in **EURAMET**

TFL Personal and Trainings

1

Personals of TFL



Sheroz Ismatullaev

Title: Head of department
Work experience: 12 years
Specialty: Legal metrology



Lyubov Gazieva

Title: Chief specialist
Work experience: 37 y.
Specialty: -TFL
-AUV



Vohobjon Nishonov

Title: Chief specialist
Work experience: 7 years
Specialty: TFL



Rakhimov Khozhiakbar

Title: specialist
Work experience: 1 year
Specialty: TFL

2.1

Trainings at UME, Turkiye



2.2

Trainings at NIM, China



2.3

Trainings at VNIIFTRI, Russia



2.4

Trainings at NMC A*STAR, Singapore



2.5

Participation in 13th EFTS, France



2.6

Participation in URSI AP-RASC, Australia



3

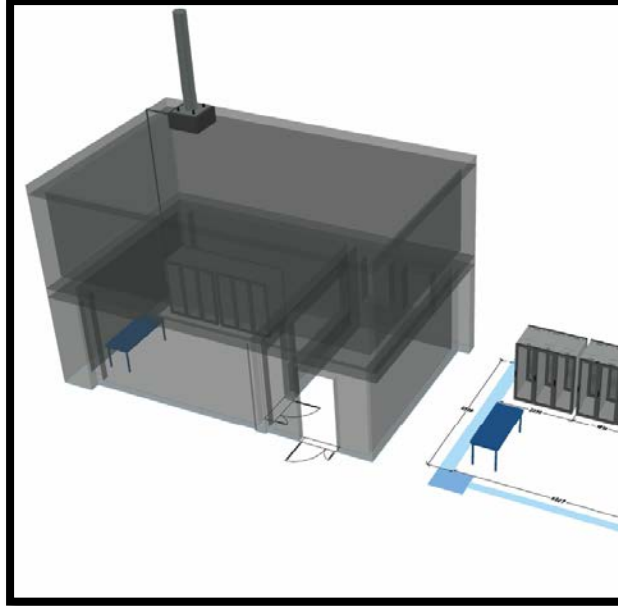
Gained knowledge and skills

Realization of Time Scales (UTC(k))
Time Transfer Techniques
Circular T and Rapid UTC (UTCr) Analysis
Time Scale Steering
Time Dissemination Infrastructure Design
Traceability, calibration, uncertainty



TFL Infrastructure

2 7 (10 m above building) distance for NTP and GNSS antennas



3 Uninterruptible power supply 60 kW (in order to supply constant electric current to the standard, climate control system and other auxiliary devices)



4 3 kW sun battery for lighting the laboratory and used organizational equipment



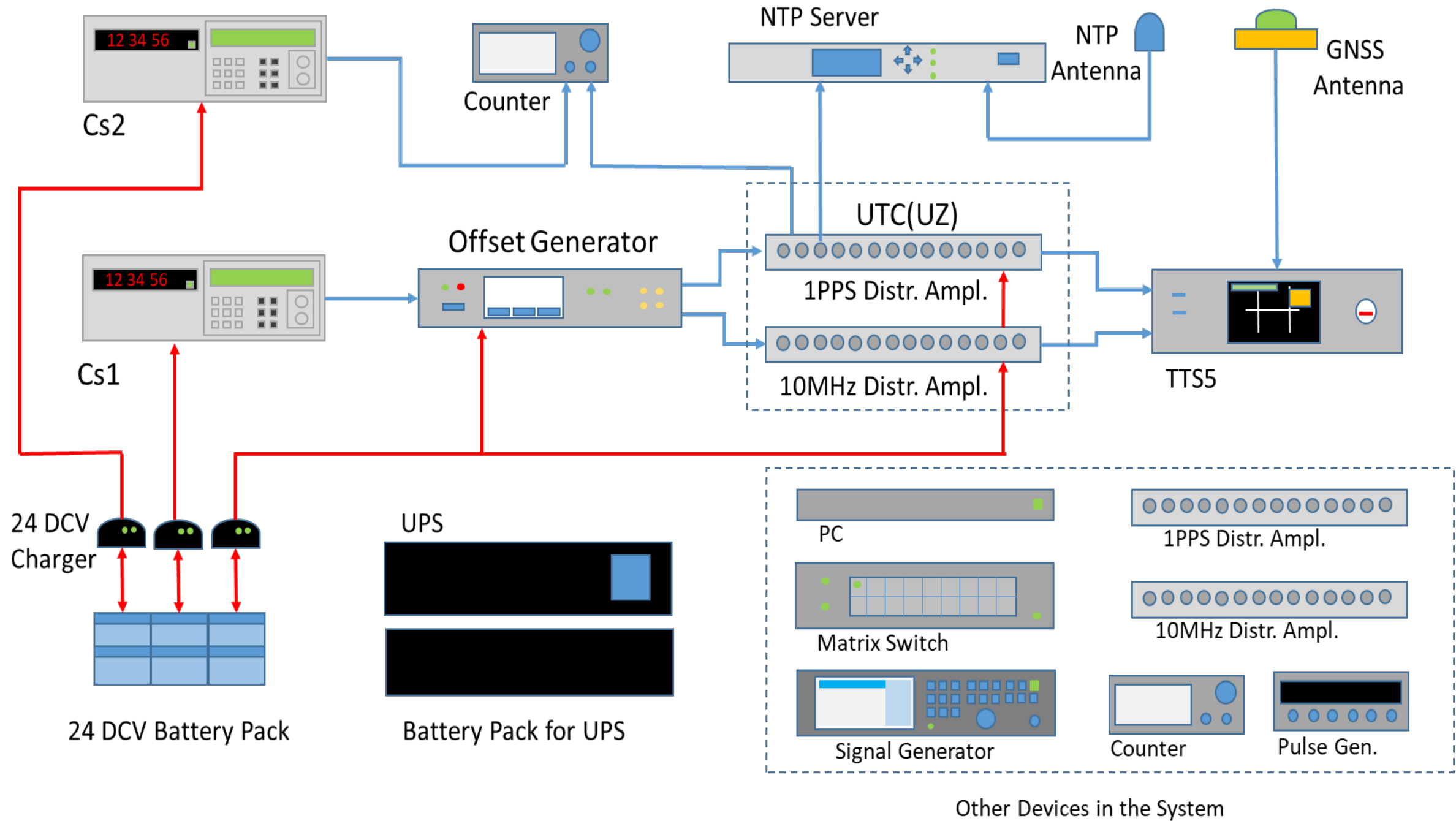
5 Precision air conditioners providing laboratory conditions



6 Control system, fire sensor, camera



Time and Frequency System Block and Connection Diagram



Calibration and Measurement Capability

Frequency measurement

1 mHz – 10 mHz	$U=4 \times 10^{-10}/f^{1/2}$ (GT = 10^4 sec)
10 mHz – 10 Hz	$U=5 \times 10^{-10}/f^{1/2}$ (GT = 100 sec)
10 Hz – 1 MHz	$U=2 \times 10^{-6}$ (GT = 10 sec)
1 MHz – 350 MHz	$U=2 \times 10^{-12} \times f$ (GT = 10 sec)
300 MHz – 15 GHz	$U=2 \times 10^{-12} \times f$ (GT = 10 sec)

Bureau
International des
Poids et
Mesures

Frequency measurement based on Phase Comparison

0,1 Hz – 200 MHz (0.1 MHz, 1 MHz, 5 MHz, 10 MHz, 100 MHz, 1PPS)	$U= 1 \times 10^{-11} / \sqrt{\tau}$
--	--------------------------------------

Frequency Stability Calibration

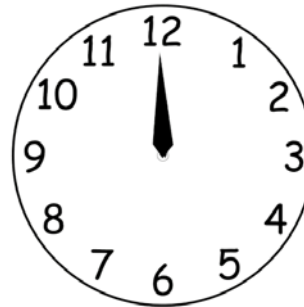
0,001 Hz – 15 GHz	$U= \frac{1,22 \times 10^{-11}}{\tau^{-0,52}}$
-------------------	--

Time Interval, Pulse Width, Rise/Fall Time

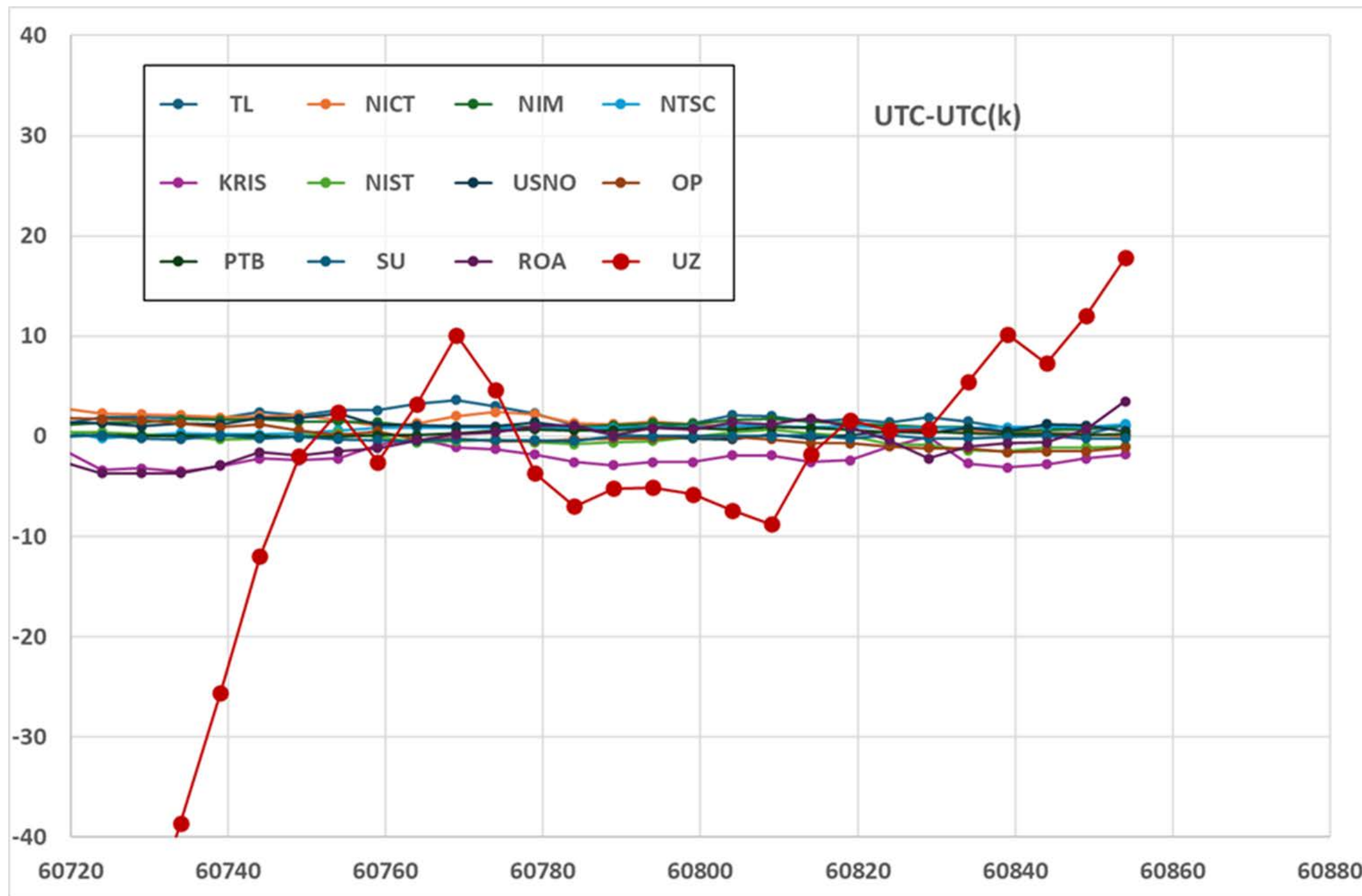
2 ns - 100000 s	$U=300$ ps
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OZAKK
O'ZBEKISTON AKKREDITATSIYA MARKAZI



Current situation of UTC(UZ) in comparison with developed UTC(k) labs



Time and Frequency Service in Uzbekistan

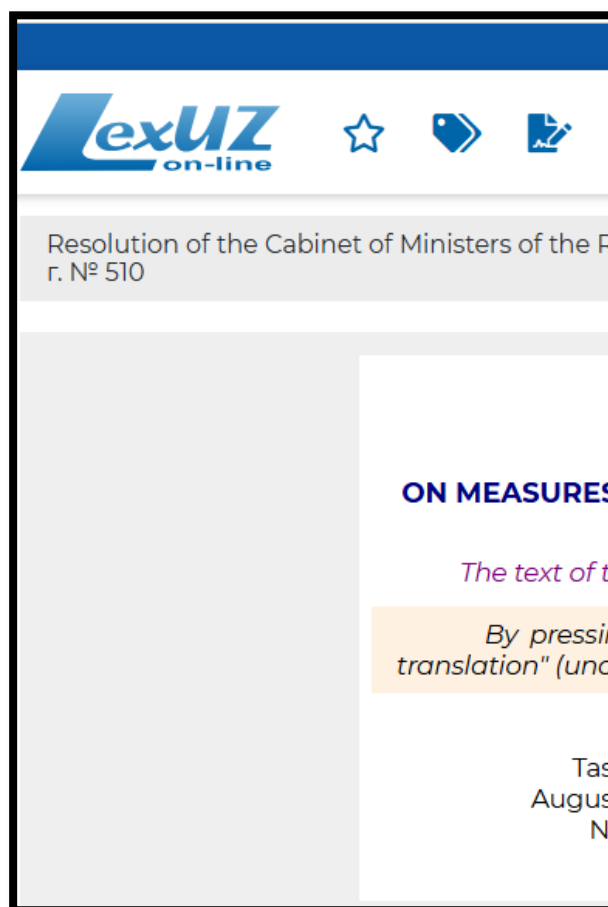
1

Resolution of the Cabinet of Ministers of the Republic of Uzbekistan, от 16.08.2024 г. № 510 “On measures for the effective organization of the activities of the **time and frequency service** of the Republic of Uzbekistan”

<https://lex.uz/ru/docs/-706>

2

Dissemination of UTC(UZ)



The advertisement features a dark blue background with a globe in the center. The text "Uzbekistan accurate time" is prominently displayed in white, followed by the time "11:33:33.372" and the date "May 21, 2024 year, Tuesday". Below the date, it says "UTC (UZ) Tashkent (UTC+5)". At the top, it states "Uzbekistan accurate time is generated using the National Standard of Time and Frequency Unit, launched in 2024 at the Uzbek National Institute of Metrology." On the right side, there is a logo for the 100th anniversary of the Uzbek National Institute of Metrology (UzNIM) and the text "O'zbekiston milliy metrologiya instituti". At the bottom, it says "To be synchronized with the National Time Scale of Uzbekistan UTC (UZ) and metrological traceability is ensured to the International Bureau of Weights and Measures (BIPM) Coordinated Universal Time (UTC)." The website "time.nim.uz" is mentioned at the bottom. There are also icons of NTP servers and a Windows activation notice in the bottom right corner.

Membership of BIPM TAI CLUB and Comparisons

1 **Joining BIPM TAI Club**
In order to become member TAI club UzNIM director applied order with required docs and after trial period of evaluation, UzNIM TFL has become member of BIPM TAI Club.

2 **Key, Supplementary and Pilot Comparisons**
UzNIM TFL is attending to the following ongoing key and bilateral comparison :

- CCTF-K001.UTC
- 883/UZ/23 Bilateral comparison of UTC(UME) and UTC(UZ) time scales
- COOMET.TF-S1, COOMET.TF-S2, COOMET.TF-S3

Geographical distribution of the laboratories that contribute to TAI and time transfer equipment (2024)



	IDENTIFIER	AREA	SUB-FIELD	DESCRIPTION	PARAMETERS	TIME OF MEASUREMENTS
☐	CCTF-K001.UTC	Time and Frequency	Time	Calculation of the reference time scale UTC (Coordinated Universal Time)		1977 -
☐	COOMET.TF-S1	Time and Frequency	Frequency	Direct frequency	Measurement conditions: Temperature from 20 °C to 25 °C Humidity from 30 % RH to 80 % RH	2025 - 2026
☐	COOMET.TF-S2	Time and Frequency	Time	Time interval	Time interval between two pulses using a dual-channel time interval meter Measurement conditions: Temperature from 20 °C to 25 °C Humidity from 30 % RH to 80 % RH	2025 - 2026
☐	COOMET.TF-S3	Time and Frequency	Time	Pulse duration	Pulse duration measurement using a two-channel time interval meter Measurement conditions: Temperature from 20 °C to 25 °C Humidity from 30 % RH to 80 % RH	2025 - 2026



21.06.2023 №38-15/181e

ies and Gentlemen,
se find attached the form of a **proposed OMET project** in the subject field "Time Frequency":
/UZ/23 "Bilateral comparisons of the UTC (E) Türkiye and UTC (UzNIM) Uzbekistan : scales"
se note that the comparisons are positioned ilateral comparisons.
t regards,
Nadezhda Liakhova
Head of COOMET Secretariat

TFL ACTIVITIES 2024-2026

2024 year

1

Provided accreditation through O'zAKK national acc. body

ISO 17025 management system has been implemented in our TFL

2

Provided PEER REVIEW of TFL under COOMET in December

ISO 17025 management system has been implemented in our TFL

2025 year

3

Implemented Time and Frequency Service in Uzbekistan

Dissemination of accurate legal time among Uzbekistan

4

Calibrated Time transfer system TTS-5 by G1 lab Chungwa

Telecom, Taiwan Time transfer system TTS-5 is calibrated and waiting the calibration results

5

CMC Publication in TFL

CMC applied for publication BIPM KCDB, now under review of intra-RMO

2026 year

6

Development of calibration system

capability for frequency generation and measurement up to 50 GHz including signal analysis and phase noise measurements opens the possibility calibration service to telecommunication, electric and electronic, gas flow industry and military





THANK YOU FOR YOUR ATTENTION!

BIPM UTC Summer School

9-11 September 2025, BIPM, Sèvres France

Vohobjon Nishonov

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