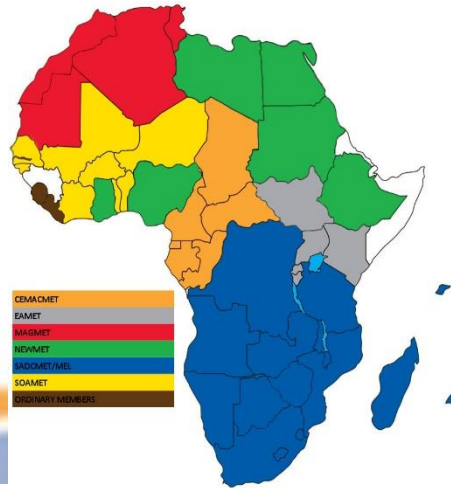




**AFRIMETS**  
Intra-Africa Metrology System  
Système Intra-Africain de Métrologie



CDMAMET  
EAMET  
MAMET  
NAMET  
SADOMET/ML  
SOAMET  
ORDINARY MEMBER

# AFRIMETS TECHNICAL COMITEE FOR THERMOMETRY (TC-T) REPORT

**Richard Odak**  
on behalf of **Efrem K Ejigu**  
**AFRIMETS TC-T Chair**

**17<sup>th</sup> AFRIMETS GA**  
**Venue: Argyle Grand Hotel**  
**Date: 01 August 2024**

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# AFRIMETS TC-T MEETINGS

- AFRIMETS TC-T 2024 was conducted 09 July 2024
- Virtual on Zoom media
- Represented Institutes
  - Morocco (LPEE/LNM)
  - Egypt (NIS)
  - South Africa (NMISA)
  - Tanzania (TBS)
  - Zambia (ZMA)
  - Ghana(GSA)
  - Zimbabwe (SIRDC-NMI)
  - Ethiopia (EMI)
  - Nigeria (SON-NMI)
  - Kenya (KEBS)
  - Morocco (LPEE/LNM)
  - Botswana (BOBS)



# CURRENT INTER-COMPARISON

## AFRIMETS. T-S3

- Supplementary comparison of Industrial PRT calibration capability
- Range: -50 °C to 450 °C
- Started: May 2012, postponed & re-started in 2022
- Status: Measurement
- Participating NMIs:  
South Africa, Zambia, Zimbabwe, Botswana, Namibia, Mozambique, Democratic Republic of the Congo

## AFRIMETS. T-S7

- Supplementary comparison of noble metal thermocouple
- Range: 0 °C to 1200 °C
- Started: June 2019
- Pilot/coordinator: NMISA/NIS
- Status: Measurement
- Participating NMIs:  
South Africa, Egypt, Kenya, Zimbabwe, Zambia, Botswana, Ethiopia, Morocco, Ghana.

# PLANNED SUPPLEMENTARY COMPARISON

- Radiation Thermometer (-20 °C to 1100 °C)
  - Pilot: NIS/South Africa
  - Reference: South Africa
  - Participants: South Africa, Egypt, Zambia, Tanzania, Zimbabwe, Uganda, Morocco, Zambia
  - Status: Planned
- Humidity: Dew point (-20 °C to 30 °C)
  - Pilot: NIS/South Africa
  - Reference: South Africa
  - Participants: South Africa, Egypt, Morocco, Kenya
  - Status: Planned
- Humidity: Thermo-hygrometer (20%RH – 90%RH)/(20 °C - 60 °C)
  - Pilot: NIS
  - Reference: South Africa
  - Participants: South Africa, Egypt, Tanzania, Morocco, Zambia.
  - Status: Planned
- Moisture content
  - Pilot: Zimbabwe/Egypt
  - Reference: TBD
  - Participants: Egypt, Zimbabwe, Ghana, Kenya, Tanzania.
  - Status: Planned

# PLANNED KEY COMPARISON

- AFRIMETS T-K9.x (ITS-90 key comparison)
  - Pilot: TÜBİTAK UME
  - Linking Lab: TÜBİTAK UME
  - Status: Planned
  - Participants: South Africa, Turkey, Egypt

# AFRIMETS PARTICIPATION IN CCT/APMP etc... INTER-COMPARISONS

- CCT-K9.3
  - Range: Ar to Zn
  - Pilot: CEM
  - Linking Lab: CEM
  - Status: Protocol approved; Measurement started
  - Participating AFRIMETS NMIs: South Africa
- CCT-K4.2
  - Range: Al to Ag
  - Pilot: CEM
  - Linking Lab: CEM
  - Status: Protocol approved; Measurement started
  - Participating AFRIMETS NMIs: South Africa

- CCT-K11
  - Key comparison of blackbodies for infrared ear and forehead thermometers
  - Range: 34 °C to 43 °C
  - Status: Protocol approved; measurement started
  - Participating AFRIMETS NMIs: **South Africa**
- APMP.T-K4.2
  - Key comparison of local realizations of aluminium (Al) freezing-point temperature
  - Range: Al fixed point
  - Started: 2018
  - Status: Draft A
  - Participating AFRIMETS NMIs: **South Africa**
- APMP.T-S11/S12
  - Local realization of radiation thermometer scale from Indium point to 2800 °C
  - Range: 156 °C to 2800 °C
  - Started: 2013
  - Status: Measurement completed, Report writing (pilot)
  - Participating AFRIMETS NMIs : **South Africa**



- APMP.T-S16
  - Supplementary comparison of noble metal thermocouple
  - Range: 1000 °C to 1560 °C
  - Started: 2017
  - Status: Draft A
  - Participating AFRIMETS NMIs: **South Africa**
- APMP.T-S13
  - Supplementary comparison of humidity (dew point)
  - Range: -60 °C, -70 °C, -80 °C, (-90 °C)
  - Started: 2014
  - Status: Measurement
  - Participating AFRIMETS NMIs : **South Africa**
- APMP.T-S17
  - Supplementary comparison of Air Thermometers
  - Range: -70 °C to 90 °C
  - Status: Measurement
  - Participating AFRIMETS NMIs: **South Africa**

# CMC submission

## ❑ National Institute of Standards (NIS) (Thermometry Service classification 2.2.2 & 2.3.3)

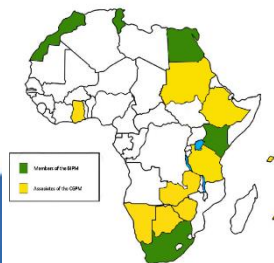
- Platinum resistance thermometer (-50 °C – 550 °C)
- Pure-metal thermocouple at fixed points Co-C, Pd-C

- Status: Under **Inter-RMO** review process

## ❑ Kenya Bureau of Standards (KEBS) (Thermometry Service classification 2.2.2)

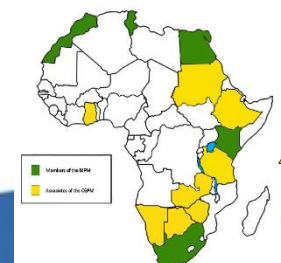
- Platinum resistance thermometer (-10°C – 200 °C)

- Status: under **Inter-RMO** Review process



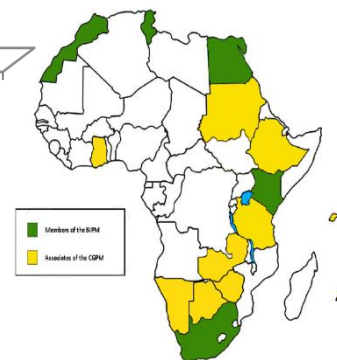
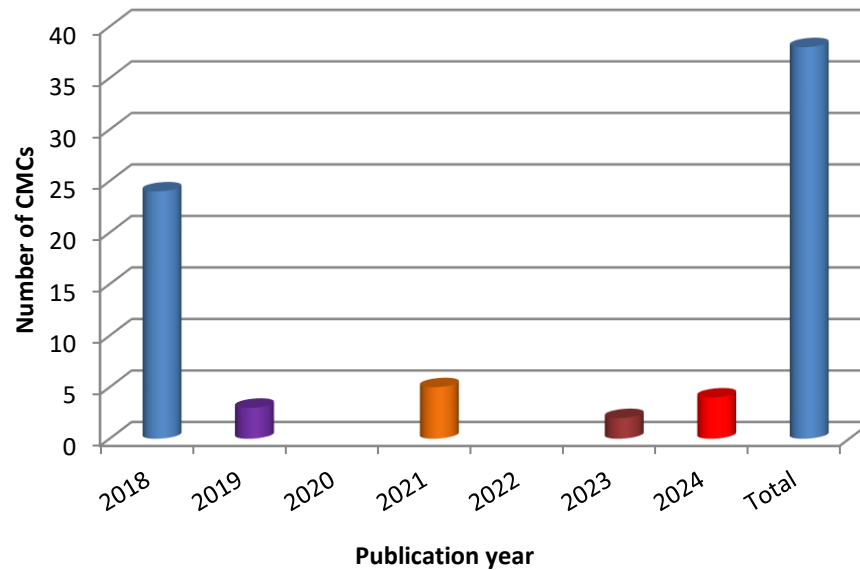
# CMC submission


- ❑ Ethiopian Metrology Institute (EMI) (Thermometry Service classification 2.2.2, 2.3.1, and 2.3.2)
  - Noble metal Thermocouple (0 °C– 1200 °C)
  - Base metal Thermocouple (0 °C – 1200 °C)
  - Status: four CMCs were published, and the rest are under **Inter-RMO** Review process
  
- ❑ Tanzania Bureau of Standards (TBS) (Thermometry Service classification 2.7.1, 2.4.1, and 2.3.1)
  - Digital Thermometer
  - Liquid in Glass Thermometer
  - Thermocouple
  - Status: Under **Intra-RMO** review process



Approved  
and  
published  
CMC in  
the past  
six years

Year	Number of CMCs
2018	24
2019	3
2020	0
2021	5
2022	0
2023	2
2024	4
<b>Total</b>	<b>38</b>





# Inter-RMO CMC review

AFRIMETS TC-T is actively participating in inter-RMO CMC reviewing process.



# Capacity Building

- NMISA provided training to Kenya Bureau of Standards (KEBS) temperature metrologist at NMISA training centre
- NMISA hosts temperature metrologist from Ghana Standards Authority (GSA) for a six-month attachment
- TBS hosted Malawi Bureau of Standards (MBS) metrologists in calibration of temperature measurement
- KEBS is establishing a training centre
- GSA provides training to metrologists from Benin



# TC-T chairmanship

Chairman: Dr. Efrem Kebede Ejigu (NMISA)

Vice-Chair: Mr. Richard Odak (KEBS)

Prof. Dr. Mohamed Gamal Ahmed (NIS)





Thank you