

## **CCT member and observer Activity Report**

**Period:** January to December 2021

**Institute:** National Metrology Institute of South Africa (NMISA)

**State economy:** South Africa

**Number of persons involved in thermometry of the institute:**

There are:

- three temperature scientist/metrologists
- two humidity scientist/metrologists
- a section-head

**Short summary of research and development:**

- The lab has conducted a development work on ear thermometer and ear thermometer BB source measurement capability. Accreditation on the two parameters is obtained
- The lab has conducted a development work on the establishment of a thermal imager measurement capability. Accreditation on the parameter is obtained
- The lab is also conducting a development work on the establishment of Eutectic fixed point measurement capability at Co-C and Pd-C for thermocouple measurement
- The lab is conducting a development work on the establishment of high temperature radiation thermometry measurement using eutectic fixed-point cells
- The lab is conducting research work on polarisation and temperature effect on the performance of a linear pyrometer.

**Short summary of recent comparison activity:**

- Piloted AFRIMETS TS-2. AFRIMETS TS-2 is completed, and report is published on metrologia and BIPM web.
- Piloted AFRIMETS TS-3. AFRIMETS TS-3 is to be re-started in 2022.
- Piloted AFRIMETS TS-7. It is at measurement stage currently at KEBS, Kenya.
- Participated in CCT K7-2021. First leg measurement completed
- Signed up to participate in CCT organised body IR comparison
- Participated in APMP TS11/12. Measurement completed, report under preparation by the pilot
- Participated in APMP TK4.2. Measurement completed, report under preparation by the pilot
- Participated in APMP TS16. Measurement completed, report under preparation by the pilot
- Signed up to participate in APMP TS17. Measurement to start soon
- Signed up to participate in APMP TK7-2021. Measurement to start soon

**Short summary of other activities:**

- Drafting MoU between CEM and NMISA for possible bilateral CCT K9.x comparison
- The lab has refurbished most of its aging equipment by replacing them with the new generation ones
- Assisted the South African Accreditation Service (SANAS) in drafting a guide for the Body Infrared thermometer measurement
- Provide technical consultancy and training services to African NMIs.

**Link to bibliography or list of bibliography (last 5 years):**

1. **Efrem Ejigu:** Characterizing a Linear pyrometer, National Laboratory Association of South Africa: Test and Measurement 2021 Conference and Workshop proceedings, submitted (Oct 2021).
2. **Efrem Ejigu (2021):** Accurate Clinical Tympanic Thermometer Measurement System at NMISA, NCSLI Measure, DOI: <https://doi.org/10.51843/measure.13.2.5>.

3. **Efrem Kebede Ejigu** (2020): The Importance of Establishing a Very High-Temperature Radiation Thermometry Measurement Capability at the National Metrology Institute of South Africa (NMISA), NCSLI Measure, DOI: <https://doi.org/10.1080/19315775.2020.1721383>
4. **Efrem Kebede Ejigu**, Souhale Hicham, Sylvia Agbesinyale, and Joel Bado4 (2020), Final report on AFRIMETS Supplementary Comparison AFRIMETS.T-S2): Platinum resistance thermometer and digital thermometer calibrations over the range -50°C to 450°C, *Metrologia* **57** 03008.
5. **E.K. Ejigu**, Simulating radiation thermometer temperature measurement error from the performance change of an interference filter due to polarization effect, Measurement (2017), DOI: <http://dx.doi.org/10.1016/j.measurement.2017.08.003>
6. **Hans Liedberg, Efrem Kebede Ejigu, Tshifhiwa Madiba, Sven du Clou**, Blessing Chibaya, Victor Mwazi, Tebogo Kajane, Victor Mundembe, Christian Ng Ha Kwong and Gilbert Madeleine (2017), Final report on AFRIMETS comparison of liquid in glass thermometer calibrations from -35 °C to 250 °C, *Metrologia* **54** 03004.
7. **Hans Liedberg**, Yasser Abdelaziz, Fitsum Tesfaye, Wilson Egadwa, Uthai Norranim, Simon Rwashana, Alphonse Kagoma, Adam Ziagi, Christian Ng Ha Kwong and Gilbert Madeleine (2017), Report on AFRIMETS supplementary comparison: platinum resistance thermometer and digital thermometer calibrations against ITS-90 over the range -50 °C to 450 °C (AFRIMETS.T-S1), *Metrologia* **54** 03003
8. Nurulaini Md Ali, Hafidzah Othman, Mong-Kim Ho, Inseok Yang, Victor Gabi, Zhe Zhang, Ying Sheng, Jing Hu, Jintao Zhang, Shu-Fei Tsai, Su-Chuion Liao, Md Shafiqul Alam, Uthai Norranim, Charuayrat Yaokulbodee, **Hans Liedberg**, Mohamed Gamal Ahmed, Naser Harba, Mustafa Fuad Flaifel, Suherlan, Aditya Achmadi, Kho Haoyuan, Fan Yan, Neoh Boon Kwee, Pham Thanh Binh16 and Monalisa Ragay (2017), Final report on APMP supplementary comparison of industrial platinum resistance thermometer for range -50 °C to 400 °C. (APMP.T-S6), *Metrologia* **54** 03001.