CCT member and observer Activity Report

Period: January to December 2021

Institute: Instituto Nacional de Metrología de Colombia, [INM Colombia]

State economy: Colombia

Number of persons involved in thermometry of the institute: 4

Short summary of research and development:

International Temperature Scales, ITS-90:

- Characterization of temperature fixed points for contact: Hg, In, Sn, Zn, Al and Ag cells.
- Fabrication and characterization of graphite cavity blackbodies for radiation thermometry.

Industry:

- Project ColombiaMide

Short summary of recent comparison activity:

SIM.T-S10
SIM.T-S11
SIM.T-S12
SIM.T-K9.2
SIM.T-K6.8

Short summary of other activities:

Calibration guides within the Colombian Network of Metrology.
Technical Standards: Thermometry within the Sectorial Unit for Standardization in Metrology.
Temperature course for Instituto Boliviano de Metrología, IBMETRO.
Temperature worshop for CARIMET countries.

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

1. "Recomendación Metrológica para Laboratorios. Buenas Prácticas de Medición en el Uso de Termómetros de Radiación y Sistemas de Medición de Temperatura Corporal". 2021. https://inm.gov.co/web/wp-content/uploads/2021/12/Recomendacio%CC%81n-Metrolo%CC%81gica-para-Laboratorios-Buenas-Pra%CC%81cticas-de-Medicio%CC%81n-en-el-Uso-de-Termo%CC%81metros-de-Radiacio%CC%81n-y-Sistemas-de-Medicio%CC%81n-de-Temperatura-Corporal.pdf
2. "Guía para la determinación de humedad en granos". 2021. https://inm.gov.co/web/wp-content/uploads/2021/12/GUIA-DETERMINACIO%CC%81N-CONTENIDO-DE-HUMEDAD.pdf

3. "Guía para la calibración de termómetros de radiación y su aplicación para la medición de la temperatura corporal". 2021. https://inm.gov.co/web/wp-content/uploads/2021/12/GUIA-TERMOMETROS-CLINICOS_2021-12-26-1.pdf

4. "Estimation of calibration intervals using Bayesian inference". S Carvajal, A Medina, A Bohorquez, C Sanchez. *Measurement*. 187, 110316, 2022. https://doi.org/10.1016/j.measurement.2021.110316

5. "Interlaboratory comparison of relative humidity standards among Latin American National Metrology Institutes (SIM.T-S10)". Metrologia 58(1A):03001. http://dx.doi.org/10.1088/0026-1394/58/1A/03001

6. "Desarrollo e implementación de un sistema de calibración de termómetros clínicos infrarrojos de oído". A Bohorquez, C Sanchez, S Carvajal, N. Vargas. *Momento*. 60. 2020. https://doi.org/10.15446/mo.n60.79074

7. "Long-Term Loading Effect on Stability and Spatial Uniformity of Climatic Chambers". Andrés J Bohórquez, Sergio A. Carvajal, Ciro A. Sánchez, Astrid Riveros. 17th IMEKO TC 10 and EUROLAB Virtual Conference. "Global Trends in Testing, Diagnostics & Inspection for 2030". (2020). https://www.imeko.org/publications/tc10-2020/IMEKO-TC10-2020-018.pdf

8. "Guía de Calibración de Termómetros de Radiación". 2019. http://www.inm.gov.co/web/wp-content/uploads/2019/12/guia_para_la_calibracion_de_termometros_de_radicacion.pdf

9. "Guía de calibración de termómetros digitales con sensor tipo PRT, termistor y termopar en baños líquidos y hornos de bloque metálico". 2019. http://www.inm.gov.co/web/wp-content/uploads/2019/12/Guia_de-calibracion_de_termometros_digitales2019.pdf

10. "Traducción guía DKD-r-5-7 calibración de cámaras climáticas". 2019. http://www.inm.gov.co/web/wp-content/uploads/2019/12/Guia_DKDR5-7-2019.pdf

11. "Modelling of thermal effects in a slim tin fixed-point cell". S Carvajal, J Ramirez, A Bohorquez, C Sanchez. *International Journal of Metrology and Quality Engineering* 10, 17 (2019). http://dx.doi.org/10.1051/ijmqe/2019017

12. "Comparison of Models for Heat Transfer in High-Density Fibrous Insulation". S Carvajal, E Garboczi, R Zarr. Journal of Research of the National Institute of Standards and Technology Volume 124, Article No. 124010 (2019) https://doi.org/10.6028/jres.124.010

13. "Temperature effect in the calibration of capacitive humidity sensors". S Carvajal, C Sanchez. *International Journal of Metrology and Quality Engineering* 9, 9 (2018). https://doi.org/10.1051/ijmqe/2018010

14. "Correlation Effects in the Uncertainty Estimation of Two-Pressure Humidity Generators. S Carvajal, C Sanchez. *J. Phys.: Conf. Ser.* 1065 122018 (2018) https://doi.org/10.1088/1742-6596/1065/12/122018

15. "Sensitivity Analysis of Factors Affecting the Calibration of Heat-Flow-Meter Apparatus". R Zarr, S Carvajal, J Filliben. ASTM Journal of Testing and Evaluation 47, 4 (2018). https://www.astm.org/jte20170588.html, ISSN: 0090-3973, DOI: 10.1520/JTE20170588