

CENTRO ESPAÑOL DE METROLOGÍA

ACTIVITY REPORT

2024-2026

Publications:

1. “Thermodynamic temperature measurement of an Al FP used for radiation thermometry” M. J. Martin, J. M. Mantilla, D. Araña. *Temperature: Its Measurement and Control in Science and Industry*, Vol. 9, AIP Conf. Proc 3230, 030005-1-7, 2024 <https://doi.org/10.1063/5.0234362>
2. “Thermodynamic temperatures of Fe-C, Pd-C, Ru-C and WC-C for the mise-en-pratique of the kelvin up to 3020 K” M. Sadli, F. Bourson, D. Lowe, K. Anhalt, D. Taubert, M. J. Martin, J. M. Mantilla, F. Girard, M. Florio, C. Gözönünde, H. Nasibli, N. Sasajima, X. Lu, S. Briaudeau, G. Machin, L. Knazovicka, O. Kozlova. *Temperature: Its Measurement and Control in Science and Industry*, Vol. 9, AIP Conf. Proc 3230, 020004-1-14, 2024 <https://doi.org/10.1063/5.0234550>
3. “High-Temperature Fixed-Point Furnace Uncertainty” D. Lowe, G. Machin, J. M. Mantilla, M. J. Martin, F. Girard, M. Florio, M. Sadli, F. Bourson, H. Nasibli, Ö. Pehlivan. *Temperature: Its Measurement and Control in Science and Industry*, Vol. 9, AIP Conf. Proc 3230, 070006-1-7, 2024. <https://dx.doi.org/10.6028/NIST.SP.2100-05>
4. “Improving body temperature measurement on a global basis” G. Machin, X. Lu, M. J. Martin, I. Pusnik, L. Wang. *Temperature: Its Measurement and Control in Science and Industry*, Vol. 9, AIP Conf. Proc 3230, 130004-1-6, 2024 <https://doi.org/10.1063/5.0234179>
5. “Construction and comparison of high temperature fixed points at NRC and CEM” J. M. Mantilla, D. J. Woods, R. Emms, M. J. Martín, A.D.W. Todd and D. del Campo. *Journal of Physics: Conference Series* 2554 (2023) 012007 doi:10.1088/1742-6596/2554/1/012007 [10.1088/1742-6596/2554/1/012007](https://doi.org/10.1088/1742-6596/2554/1/012007)
6. M. J. Martin, J. M. Mantilla “The transition from ITS-90 to primary thermometry above 1235 K” *Phil. Trans. R. Soc. A* 384: 20240448. <https://doi.org/10.1098/rsta.2024.0448>
7. O. Kozlova, R. Braive, T. Briant, S. Briaudeau, P. Castro-Rodríguez, G. Du, T. Erdoğan, R. Eisermann, E. Ferreux, D. Imbraguglio, J. E. Jordan, S. Krenek, G. Machin, I. P. Marko, T. Martel, M. J. Martin, R. A. Norte, L. Pitre, S. Pourjamal, M. Queisser, I. Rebolledo-Salgado, I. Sanchez, D. Schmid, C. Shakespeare, F. Sparasci, P. G. Steeneken, T. Steshchenko, S. J. Sweeney, S. Tabandeh, G. Winzer, A. Yamsiri, A. V. Zamora Gómez, M. Zelan, L. Zimmermann “European Partnership in Metrology project: Photonic and quantum sensors for practical integrated primary thermometry (PhoQuS-T)” *MDPI Metrology* 2025, 5, 44. <https://doi.org/10.3390/metrology5030044>

8. J. V. Pearce, G. Machin, A. D.W. Todd, M. J. Martín, Y. Pan, K. Zhou, Å. A.F. Olsen, A. Kowal, C. Gaiser, Y. Kawamura, T. Nakano. "Future traceability of practical primary thermometry and self-validating thermometry" *Phil. Trans. R. Soc. A* 384: 20240453. <https://doi.org/10.1098/rsta.2024.0453>
9. G. Machin, R. Gavioso, M. Dobre, C. Gaiser, M. J. Martin, R. Underwood "European Partnership in metrology project: Dissemination of the redefined kelvin (DireK-T)", *Measurement: Sensors*, 101620 (2025) <https://doi.org/10.1016/j.measen.2024.101620>
10. I., Mueller, F. Girard, M. Florio, H. Nasibli , C. Gozonünde, M. J. Martin, J. M. Mantilla, M. Sadli, S. Kosmalski, X. Lu, L. Buenger , K. Anhalt, D. Hutzschenreuter "CCT K11 blackbody temperature from 34.5 °C to 41.5 °C – Reporting and evaluation in the EURAMET loop using digital calibration certificates" *Measurement: Sensors* Volume 38, Supplement, May 2025, 101626 <https://doi.org/10.1016/j.measen.2024.101626>
11. M. Le Menn, A. O'Carroll, E. Woolliams, M. Lucas, C. Garcia-Izquierdo and A. Merlone "The measurement model of Copernicus trusted fiducial reference measurement drifting buoys for sea-surface temperature" *Journal of Atmospheric and Oceanic Technology*, 2025 DOI: [10.1175/JTECH-D-24-0117.1](https://doi.org/10.1175/JTECH-D-24-0117.1)
12. F. Sparasci et al "EURAMET.T-K9 regional key comparison ITS-90 SPRT calibration from the Ar TP to the Zn FP" *Metrologia*, 61 (1A), 2024 Tech. Suppl. 03005 DOI [10.1088/0026-1394/61/1A/03005](https://doi.org/10.1088/0026-1394/61/1A/03005)
13. C. Garcia-Izquierdo, S. Hernandez, A. Casas, M. Mazzola, A. Merlone, Y.-A. Roulet "Intercomparison of radiation shields in polar climate. COAT project" *TECO-2024 proceedings*. <https://wmo.int/site/teco-2024>
14. C. García Izquierdo, S. Hernandez, M. Parrondo, A. Casas, A. Viola, M. Mazzola, A. Merlone, Y. A. Roulet. "COAT project - intercomparison of thermometer radiation shields in the arctic" *Atmosphere* 2024, 15, 841. <https://doi.org/10.3390/atmos15070841>
15. C. García Izquierdo, G. Coppa, S. Hernandez and A. Merlone. "Metrological evaluation of the building influence on air temperature measurements" *Atmosphere* 2024 15 (2), 209 DOI: [10.3390/atmos15020209](https://doi.org/10.3390/atmos15020209)

Communications to Congress:

1. M. Dobre, R. Gavioso, C. Gaiser, M.J. Martin, R. Underwood, G. Machin "State-of-the-art in the realization of the redefined kelvin: latest project DireK-T achievements" Congress XXIV IMEKO 2024, Hamburg, Germany.
2. I. Sanchez, I. Castro, D. Ramos, M. J. Martin "Q-factor optimization of a photonic crystal through machine learning" Congress MRS Fall Meeting 2024 (Boston, USA)

3. D. Araña, J. M. Mantilla, V. Marcos y M. J. Martin. "Calibration of optical fibre-based sensors at CEM". Tempmeko'2025. Reims (France), 2025
4. I. Sanchez, A. Casas, M. J. Martin, I. Castro, D. Ramos. "Simulation and measurement of nano-photonic sensors for thermometry". Tempmeko'2025. Reims (France), 2025.
5. D. Araña, J. M. Mantilla, M. Rodriguez, V. M. Marcos, M. J. Martin, E. Rojas. "Traceable DTS cable for detailed temperature monitoring of an energy storage tank". Tempmeko'2025. Reims (France), 2025.
6. J. M. Mantilla, M. J. Martín. "Thermodynamic temperature measurement from Zn to Ag using relative primary radiation thermometry". Tempmeko'2025. Reims (France), 2025.
7. I. Pusnik, M.J. Martin, F. Bourson, M. Sadli, D. Mac Lochlainn, L. Knazovicka, K. Anhalt, V. Mlacnik. "The need for a Guide on Radiation Thermometry". Tempmeko'2025. Reims (France), 2025.
8. D. Urban, I. Mueller, F. Girard, M. Florio, H. Nasibli, C. Gözönünde, M. J. Martin, J. M. Mantilla, M. Sadli, S. Kosmalski, X. Lu, L. Buenger, K. Anhalt, D. Hutzschenreuter, F. Haertig. "Evaluation of key comparisons using the digital metrology expert tool (DME)". Tempmeko'2025. Reims (France), 2025.
9. R. M. Gavioso, C. Gaiser, M. J. Martin, M. Dobre, R. Underwood, G. Machin. "The DireK-T project for dissemination of thermodynamic temperature". Tempmeko'2025. Reims (France), 2025.
10. H C McEvoy, D H Lowe, G Machin, M J Martin, J M Mantilla, K Anhalt, M Sadli, F Bourson, N Sasajima, T Nakano, X Lu, Y Yoo, H Yoon, A Todd. "Outcome of the CCT comparison of ITS-90 realisations above the silver point". Tempmeko'2025. Reims (France), 2025.
11. M. Rodríguez-García, M. Casanova, D. Araña, J.M. Mantilla, R. Bayón, C. Valverde, E. Rojas. "Distributed temperature sensors for monitoring high temperature solar salt systems" 31st SolarPACES, 2025, Almeria, Spain.

Involvement in research projects:

1. European Partnership on Metrology. Project 22IEM02 DireK-T "Dissemination of the redefined kelvin" 2023-2026
2. European Partnership on Metrology. Project 22IEM07 INFOTerm "Integrated European research, calibration and testing infrastructure for fibre optic thermometry" 2023-2026

3. European Partnership on Metrology. Project 23FUN01 PhoQuS-T “Photonic and quantum sensors for practical integrated primary thermometry” 2024-2027
4. R&D programme of the Madrid region (national funding). Project TEC-2024/ECO-99 HyCoTec “Quantitative Characterization Techniques for Hydrogen-based Fuel Combustion” 2024 - 2027