



1. General Aspects

In the period covered by this report, TC-PR has continued its work in support of EURAMET in relation to the MRA in the area of photometry and radiometry (comparisons, and CMCs management). It has continued to foster cooperation among its members to improve their metrological capabilities in this area and to keep European capabilities as a whole to the top international level.

This period has seen the incorporation of Ukraine as an observer, so that the current membership is made up of 24 NMIs and 2 DIs plus four observers (2 DIs and 2 NMIs).

TC-PR has continued to foster contact between its members and EMNs that are close to its field of expertise: Advanced Manufacturing, Climate and Ocean Observation, Mathematics and Statistics and Quantum Technologies.

TC-PR chair represents EURAMET in the CMC and key comparisons working groups of the CCPR of the CIPM. In addition, one CCPR member, M. Smid, is the chair of the CMC working group and several TC-PR members are active in various CCPR working groups. Maria Luisa Rastello is President of CCPR.

2. Projects

Currently, there are 15 active projects within the TC-PR with the status “agreed” (1), “in progress” (6) or “ongoing” (8). 7 of these are comparisons, 6 are traceability projects, 1 is a consultation project and 1 is a research project.

- The consultancy project PR1101 “Strategic planning in Photometry and Radiometry” is led by the TC chair. The project seeks to explore, which avenues research and development within photometry and radiometry (PR) will be taken in the future. The outcomes of the project will be important for revision of existing roadmaps and strategic agenda for PR as well as point toward future common research projects in PR. This project has been developed continuously since its establishment.
- The research project PR1048 Cryogenic Solar Absolute Radiometer (CSAR) aim to develop an instrument that will be able to serve as a future primary standard for the ground-based measurement of Solar Irradiance. The long-term objective is to replace the current artefact-based standard (World Standard Group, WSG) with an instrument that is exclusively based on fundamental physical principles, and that can therefore operate as a true SI standard. A new coordinator has been assigned to this project.
- The traceability projects have the aim to maintain traceability between participating NMIs within the TC-PR. There have been no significant developments in these projects during this period.

For the “Comparison” projects, see next section.

3. Comparisons

The following comparisons are currently in progress. Details can be found on the EURAMET project website.



REG. NO.	TITLE	PILOT	STATUS	KCDB
443	<u>Comparison of Ultraviolet Power Meters</u>	LNE	in progress	<u>EURAMET.PR-S4</u>
1412	<u>Key Comparison on spectral regular transmittance</u>	LNE-LCM/CNAM	in progress	<u>EURAMET.PR-K6.2015</u>
1456	<u>Key comparison on spectral regular transmittance 2018</u>	LNE-LCM/CNAM	in progress	<u>EURAMET.PR-K6.2015.1</u>
1468	<u>Pilot study on the detection efficiency of single-photon detectors - SI-SPAD</u>	PTB	in progress	
1505	<u>Key comparison on luminous intensity 2020</u>	METAS	in progress	<u>EURAMET.PR-K3.2020</u>
1509	<u>Trilateral comparison of spectral diffuse reflectance</u>	UME	in progress	<u>EURAMET.PR-K5.2022</u>
1578	Supplementary comparison in "Fiber Wavemeters"	IO-CSIC	agreed	

Agreed but not yet registered is a supplementary comparison on spectral responsivity based on electrical substitution cryogenic radiometers, piloted by DFM. Protocol is under preparation.

Proposed, but not yet registered is a supplementary comparison on fibre power meters piloted by DFM. Protocol under preparation.

4. CMCs

As part of the digitalization process and in collaboration with the CCPR and the other RMOs, a harmonization of the CMCs in the photometry branch as well as in the emitter properties branch is being carried out. This process is aimed at facilitating the reading of CMCs by machines in the near future. The same will be done with the other CMC branches in PR.

During this period, 12 new CMCs have been published and 9 ones have been modified in the KCDB 2.0.

Review of CMCs from Russia and Byelorussia has been rejected according to the EURAMET position statement.

As of May 3rd 2023, the status of CMCs submitted for review by TC-PR members is as shown in the table below.

Status at May 3 rd , 2023	Number of submissions
RMO: Under review	18
RMO: Revision Requested	8
JCRB: Under Review	4
JCRB: Revision Requested	2
JCRB: Waiting for VOTE	0

5. Activities of the Subcommittees

TC-PR has no Subcommittees.

6. Participation in EMPIR / EPM

Participation of TC-PR in the second call of EPM can be summarized as follows. From the 5 PRTs submitted (HLT: 1 / IEM: 3 / NRM:1), 3 advanced to SRTs (HLT: 2 / IEM: 2), 3 were submitted as JRP (HLT: 2 / IEM: 2), from which 3 were granted (IEM: 2 / NRM:1).

The TC is currently involved in the following projects:

EMPIR call 2018 SI Broader Scope	18SIB03, BxDiff
EMPIR call 2018 SI Broader Scope	18SIB10, chipS-CALe
EMPIR call 2018 Network	18NET04, ForClimateOcean
EMPIR call 2019 Energy	19ENG01, Metro-PV
EMPIR call 2019 Environment	19ENV04, MAPP
EMPIR call 2019 Environment	19ENV07, MET4ClimOS
EMPIR call 2019 Normative	19NRM02, RevStdLED
EMPIR call 2019 Normative	19NRM06, MeTISQ
EMPIR call 2019 Network	19NET02, ENM-Quantum
EMPIR call 2020 Industry	20IND05, QADeT
EMPIR call 2020 Fundamental	20FUN05, SEQUME
EMPIR call 2020 Normative	20NRM01, MetTLM
EMPIR call 2020 Small Collaborative Project	SCP-03, SmartPhora
EPM call 2021 Green Deal	21GRD03, PaRaMetriC
EPM call 2021 Normative	21NRM08 HiDyn
EPM call 2022 Integrated European Metrology	JRP-s05, NEWSTAND
EPM call 2022 Integrated European Metrology	JRP-s01, S-CALe Up
EPM call 2022 Normative	JRP-h13 MetroMeD

A list with links to the TC-PR EMRP and EMPIR projects can be found here:

<https://www.euramet.org/technical-committees/tc-pr/emrp-empir/>.

7. Capacity Building: Activities of the last year and future needs

A Small Collaborative Project (SCP-03, SmartPhora) under the title *Smart specialization and stakeholder linkage in Photometry and Radiometry* has continued to develop with several NMIs of this committee.

TC-PR discusses collaboration needs among its members each year at a seminar held in conjunction with its annual meeting early in the year.

8. Meetings

The annual EURAMET TC-PR meeting was held on January 25 to 26, 2023, with a Workshop prior to the meeting on January 24, 2023. The annual meeting was held in a hybrid format, hosted by METROSERT, Estonia.

The topics of the workshop were:

- Preparation and discussion on proposals for the Call 2023 of the European Partnership on Metrology.
- Report on the Small Collaborative Project within TC-PR.
- Discussion on other collaborative projects.

In addition, as decided at the annual meeting on 2021, an additional ad-hoc workshop on the current EMPIR projects was held on Thursday 26 afternoon.

Next meeting will be at TUBITAK UME, Turkey, January 23rd to January 25th, 2023.

9. Issues

Nothing to remark.

10. Strategic Planning

In the TC-PR meeting 2023 held on January 25th – 27th, a workshop on the upcoming call within the European Partnership on Metrology was held (January 24), where the proposed PRTs were discussed in detail. The support from the TC to those PRTs was decided later during the annual meeting. Furthermore, a workshop dealt with the results and outcomes of running EMPIR Projects: ChipSCALE, MeTISQ, MAPP, BxDiff, SEQUME, QADeT, RevStdLED and MetTLM.

EMNs connected to the TC (Climate and Ocean, Quantum Technologies Mathematics and Statistics and Advanced Manufacturing) were presented by their EMN Chairs during the annual meeting.

Information on the upcoming European Partnership on Metrology calls was given and decision on the support of the discussed project proposals was made.

TC-PR members were informed about the conclusion of the roadmap for Photometry and Radiometry.

As far as upcoming comparisons are concerned, the next KCs were discussed and pilot labs established.

11. Outlook for 2023/2024

In the next period, the focus will be mainly on the following topics:

- The collaboration will be more strengthened between the members of the TC-PR. Small collaborative projects and other action for capacity building will be considered and supported.
- TC-PR will continue dealing with the established European Metrology Networks and those that may be created in the future. The activities of the TC have to be aligned with the EMN activities. Furthermore, it has to be assured, that also the other TC-PR-relevant topics will find their place in the new EURAMET structure with respect to progress in research and development.
- The application for new CMCs by TC-PR members and the management of those published seems to be an unfinished issue for some TC members, so it will be necessary to continue to support those members to become familiar with KCDB 2.0.
- A long-term activity is the planning of the second round of the EURAMET Key Comparisons in order to follow-up quickly the currently running CCPR Key Comparisons.
- Continue the discussion on the contribution that the TC-PR can make to digitalization in the EURAMET environment and cooperating with the other RMOs.
- The promotion of capacity building tools among members is a priority for the TC.

During the workshop on cooperation between members, the issue of the difficulties that several NMIs are having in finding qualified personnel to meet their human resource needs came up. Others pointed to the increasing costs of publishing articles in open science.