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## 1. General Aspects

EURAMET TC-PR has currently representative from 23 EURAMET members and 1 associate (a designated institute). Several members are participating at the joint research project 2.3 (quCandela).

## 2. Projects

The latest progress reports of all TC-PR projects can be found at the TC-PR webpages. The previous reports are stored in the restricted part of the TC-PR webpages. In respect to the year 2000 the number of traceability projects and comparisons has significantly increased.

Number of agreed or proposed TC-PR projects	2000	2009
Traceability	9	17
Comparison	7	11
Cooperation	3	4
Consultation	3	2

### New projects (agreed or proposed):

During the last period the following new projects were proposed or agreed:

#### PR1101 Future Trends in Radiometry and Photometry (coordinated by DFM)

The project seeks to explore, which avenues research and development within photometry and radiometry (PR) will take in the future. The project will try to find answers to questions such as: Which future problems of general societal concern can be addressed using PR technologies. What role can PR play in the area of "Health", "Food", "Environment", or more general "Life Science"? Can PR play a role in future: space exploration, optical communication, and lighting? The outcome of the project will be important for revision of existing roadmaps for PR as well as point toward future common research projects in PR.

#### PR1106 Traceability of the spectral solar UV irradiance scale to SI units (PMOD/WRC and PTB)

The World Meteorological Organization has designated the European UV Calibration Center (EUVC) operated at PMOD/WRC as reference center for solar UV Radiation measurements in Europe. An important task of the EUVC is to maintain a stable reference for spectral irradiance over long time scales to allow the detection of long-term changes of solar UV radiation.

The traceability to SI units is obtained through the calibration of double monochromator spectroradiometers with secondary transfer standards realised by 1000 W tungsten halogen lamps. Since one of the tasks of the EUVC is to perform site audits at UV monitoring stations in Europe, a portable reference spectroradiometer system was developed which uses a portable calibration system to transfer the home calibration to field sites. Currently the EUVC irradiance reference is realised through the average of seven secondary standard lamps calibrated by PTB between 2002 and 2009 against the primary reference for spectral irradiance, blackbody BB3200pg. The long-term stability of the EUVC reference is checked by yearly measurements of these lamps. In addition, lamps belonging to the EUVC reference are re-calibrated by PTB on a regular basis.

The proposed project aims at:

- 1) Investigating the long-term stability of the EUVC irradiance reference by direct comparison of this reference to the primary spectral irradiance reference of the PTB.
- 2) Providing direct traceability of the EUVC irradiance reference to the SI unit of  $Wm^{-2}nm^{-1}$  by measurements of the primary irradiance reference BB3200pg of the PTB with the portable EUVC reference spectroradiometer system.
- 3) Decreasing the present uncertainty of the EUVC irradiance reference by reducing the calibration chain between the EUVC spectroradiometer system and the primary spectral irradiance reference.

### PR1107 Standards for multimode fibre metrology (proposed by METAS)

The aim of this project is to develop and to compare different kind of multimode fibre standards for the spectral attenuation and for the modal distribution (encircled flux), which could be used, for example, for the calibration of the attenuation scale of multimode OTDR. Contributions from other RMO's are welcomed.

### PR1116 Key comparison on spectral responsivity in the infrared (EURAMET.PR.K2a) (coord. by VSL)

This project involves the extension of the CCPR key comparison CCPR.PR-K2a on spectral responsivity in the wavelength range from 900 nm to 1600 nm. The proposed transfer detectors used will be Germanium photodiodes instead of InGaAs. The pilot of this comparison will be VSL (NL). In this comparison VSL (NL) and NPL (UK) will act as link laboratories to KC CCR.PR-K2a.

### 3. Comparisons

The current situation of the comparison is summaries in the table below. During the last year no key comparison has been completed.

BIPM - Identifier	Euramet Proj. Nr	quantity	pilot	status
EUROMET.PR- K1.a	1103	spect. irradiance (250-2500nm)	NPL	Technical protocol in discussion by the participant
EUROMET.PR-K2.a	1116	spect. resp. (900-1600nm)	NMi-VSL	planned
EUROMET.PR-K2.b	587	spect. resp. (300-1000nm)	IFA-CSIC	measurement completed, Draft A in preparation
EURAMET.PR- K2.b.1	1023	spect. resp. (300-1000nm), bilateral with CMI	SMU	measurement completed, Draft A in preparation
EUROMET.PR-K3.a	569	luminous intensity	PTB	measurement in progress
EUROMET.PR-K3.a.1	823	luminous intensity, bilateral with INM(RO)	LNE-INM	Draft A in discussion
EUROMET.PR-K4	569	luminous flux	PTB	measurement in progress
EUROMET.PR-K4.1	823	luminous intensity, bilateral with INM(RO)	LNE-INM	Draft A in discussion
EUROMET.PR-K5	619	spectr. diffus. reflectance	MKEH	Draft A in preparation
EUROMET.PR-K6	538	spectr. regular transmittance	LNE-INM	Draft A in discussion
EUROMET.PR-K6.1	766	spectr. regular transmittance	LNE-INM	Draft A in preparation
EUROMET.PR-K6.2	1073	spectr. regular transmittance	NMi-VSL	measurement in progress
EUROMET.PR-S2	156	high laser power	PTB	measurement in progress

#### CCPR working group on key comparisons (WG KC):

At the last CCPR WG KC meeting it has been definitively decided that the number of participants on key comparison at CCPR level is limited to 12 laboratories. EURAMET together with COOMET is entitled to a maximum of 6 laboratories. It is up to the RMO's to decide on the selection process. For this purpose a questionnaire to all EURAMET TC-PR has been sent asking for their intention of participation at the next round key comparison at CCPR and EURAMET level. Some selection rules are in discussion within the EURAMET TC-PR

#### 4. CMCs

An overview of the past and present CMC submissions is given in the table below. During the last TC-PR meeting it was decided that NMI's may submit CMC's ones a year (deadline: end of January). Unfortunately the interRMO review of the last batch took much longer than planned. The submission of the next round is therefore delayed to the end of May 2009 as the files need to be based on the published CMC (to prevent conflict of file versions).

Designation	Contents	Status	Comments
EUROMET.PR.1.2001	Initial submission from most of EUROMET NMIs	published, 2001-10-10	
EUROMET.PR.2.2002	submission from most of EUROMET NMIs	published, 2002-10-31	
EUROMET.PR.3.2005	CMCs from FI, SK, ES, and CH	published, 2006-04-26	
EUROMET.PR.4.2006	CMCs from CH, DE, FI, GB and TR	published, 2007-05-11	Some CMCs from DE(PTB), FI(MIKES), and CH(PMOD) got lost
EUROMET.PR.5.2007	Some of the lost CMCs from FI	published, 2007-06-22	fast track process, initiated during CCPR WG CMC meeting
EUROMET.PR.6.2007	Some of the lost CMCs from FI and DE	published, 2008-02-08	
EUROMET.PR.7.2007	The lost CMC's from CH(PMOD)	published, 2008-09-09	
EURAMET.PR.8.2008	CMCs from DE, FR, FI, NL	published by 2009-03-26	CMC submitted to TC-PR in April 2008
EURAMET.PR.9.2008			In preparation, deadline 2009-05-29

During the last year EURAMET TC-PR has reviewed and accepted APMP.PR.5.2008. Batch SIM.PR.4.2008 is currently under review.

#### *CCPR working group on CMC (WG CMC)*

At the last meeting of the CCPR WG CMC it has been decided how the different CMC services are related to the key comparison and what kind of supporting evidences are necessary for their claims. The rules are stricter than the original JCRB requirements: All key quantities need to be supported (imperatively) by the results of the last key comparison (or eventually a sub-sequential bilateral) on that quantity. The rules are published at JCRB website: [http://www.bipm.org/en/cipm-mra/documents/cmc\\_excel\\_files.html](http://www.bipm.org/en/cipm-mra/documents/cmc_excel_files.html)

#### 5. Activities of the Sub-Committees

TC-PR has presently no Sub-Committee.

#### 6. Participation in iMERA-Plus

Several members of the EURAMET TC-PR are participating at the "quantum candela" project (JRP2.3). The project is aimed to develop quantum standards based on few photons metrology and linking these to the existing radiometric scales. There will be a scientific workshop at the next TC-PR meeting to the present progress of the project.

#### 7. Meetings

The last meeting of the EUROMET TC-PR was held from April 23 to April 24, 2009 in Sofia/BG in connection with a scientific workshop on the JRP "quCandela". There were 21 members and 8 guests present. After the meeting, most participants visited the radiometric and photometric laboratories at BIM.

The next TC meeting will be held from 22<sup>nd</sup> to 23 April 2010 at PTB in Berlin, probably in connection with a scientific workshop on the JRP “quCandela”.

**8. Issues**

**9. Strategic planning**

During the last EURAMET TC-PR meeting a new “permanent” project has been discussed. It seeks to explore, which avenues research and development within photometry and radiometry (PR) will take in the future. The project will try to find answers to questions such as: Which future problems of general societal concern can be addressed using PR technologies. What role can PR play in the area of “Health”, “Food”, “Environment”, or more general “Life Science”? Can PR play a role in future: space exploration, optical communication, and lighting? The outcome of the project will be important for revision of existing roadmaps for PR as well as point toward future common research projects in PR.

**10. Outlook for 2009/2009**

A major objective for this year is to further clean up the situation of the different projects. Furthermore criteria for the participation at CCPR comparisons will need to be discussed in detail. Solutions to problems mentioned above have to be found, mainly how to speed up comparisons and CMC review process.

Peter Blattner, METAS  
Chair EURAMET TC-PR 2009-05-29