

Consultative Committee for Photometry and Radiometry (CCPR) President T Usuda, Executive Secretary M Stock

Meets every - 2 years Last meeting - February 2012 Members/Observers 12/4	Working groups: CMCs (WG-CMC); Key Comparisons (WG-KC); Strategic Planning (WG-SP)		
Comparison activity	Completed	In progress	Planned
CCPR KCs (& CC Supplementary)	16	5	7
RMO KCs (& SCs)	12 (10)	17 + (11)	0 + (2)
BIPM comparisons (all on-going)	0	0	0
CC Pilot studies	4	0	0
CMC	1224 CMCs in 84 service categories		
Pointers to the future, stakeholder needs and technological developments <ul style="list-style-type: none"> • Fundamental optical metrology: photon devices (secure communication, quantum computing, biophotonics). Improving the performance of cryogenic radiometers and silicon-based standards could enable radiometry to measure fundamental constants related to future revision of the SI base units. Few Photon Metrology and Quantum Enhanced Measurements • Industrial needs lead to an increasing demand for lower cost and flexible standards to be used at the workplace. Measurement of appearance is a major challenge in this field. • New Technologies, such as nanotechnology, key metrological challenge is the characterization of photonic crystals, nano-sources and nano-detectors; Metrology for new materials, metrology priorities will include the development and application of traceable measurements and predictive modelling to structure, property and performance of materials throughout their lifecycle. • Applied metrology: Novel optical radiometric capabilities for industry and quality of life: a better knowledge of innovative complex light sources will require developments on 3D metrology for optical light sources such as LEDs, OLED-arrays and displays to be characterised and calibrated with low uncertainty. Fibres for communication technologies • Energy: production and efficiency: Photovoltaics, solid-state lighting. In general radiometric/photometric metrology challenges are evolutionary in nature. • Health and Life Sciences: optical radiation for both diagnosis and treatment, most metrology issues at CCPR level likely to be covered by existing capabilities. Photon metrology for the biotechnology community • Environment and Climate: 2/3 of the 50 Essential Climate Variables (ECVs) involve some form of optical radiation measurement. This drives the need for long-term SI traceable satellite observations of the Earth and Sun system. Validating claims of high-efficiency transportation, construction and energy technologies and reduction strategies for lighting noise in living environment. • Security: development and characterization of Terahertz (THz) sources and detectors (and an emerging THz industry including medical imaging, biological screening). 			
Workload Trend & Workload Management <ul style="list-style-type: none"> • Ten year cycle. 2nd round CCPR KCs (2013-2023) are nearly identical to those carried out in the 1st round with six core quantities (luminous intensity, luminous flux, spectral irradiance, spectral responsivity, spectral regular transmittance and spectral diffuse reflectance) - and a consequent set of 10 KCs. Consideration as to the need for key comparison in extended wavelengths and for other materials would depend upon the closeness in the relationship for the measurement methodologies and artefacts for these measurement capabilities. Pilot studies currently being undertaken or investigated within the CCPR include: Fibre optic properties, specifically OTDR length; THz radiometry, regular spectral transmittance in the UV. • Criteria to manage workload at CC level developed for the 2nd round with participation limited to CCPR members with independent scale realization and CMC coverage of the quantity over the whole wavelength range, and limitations on number of participants. • Historical piloting workload, mean is around 20 PM, one 70 PM, participation typically 4 PM 			
BIPM – references to laboratory activity at the BIPM <ul style="list-style-type: none"> • BIPM has no laboratory activity in photometry and radiometry. There are no suggestions in the strategy for activity at the BIPM. 			