

**Consultative Committee for Photometry and Radiometry (CCPR)**  
25th Meeting (on-line 10-11 May 2022)

**CCPR member report on activities in radiometry and photometry since the last  
CCPR meeting (2019)**

**Reply from:** Measurement Standards Laboratory of New Zealand

**Delegate:** Annette Koo

- 
1. Summarize the recent progress in your laboratory with respect to measurement standards, research projects, and metrology services to fulfill the demands of customers in:
    - (a) broad-band radiometric quantities:  
Acquired new UV spectroradiometer optimised for calibrating UV meters with UV LED sources.
    - (b) spectral radiometric quantities:
    - (c) photometric quantities:  
Replaced standard lamps with detector-based scale for customer calibrations. Transferred luminance scale from photometer to working standard luminance meter. Validating overfill irradiance method for characterizing primary photometers.
    - (d) other area(s) relevant to CCPR:  
Goniospectrophotometry – upgraded instrument, characterised errors, participated in comparisons to establish CMCs.  
Spectrophotometry – replaced 1 m monochromator and associated optics to improve flexibility and reliability. Investigating reference materials for UV regular transmittance.
  2. What work in PR has been/will be terminated in your laboratory, if any, in the past /future few years? Please explain the reasons and provide the name of the institution if it has been/will be substituted by a DI or accredited laboratory.  
  
We no longer provide a service for photoluminescent testing. We now recommend customers use services overseas.
  3. Summarize the Capacity Building and Knowledge Transfer activities undertaken by your institute in photometry and radiometry (courses, training, ...):  
  
Spectrophotometer Calibration Training Course (August 2019)  
Remote Sensing NZ Workshop (March 2022)
  4. Summarize the research projects currently performed within a collaboration with one or more NMIs or DIs (name of the project, participants):

MSL was a partner in the EMPIR funded Joint Research Project “Bidirectional reflectance distributions” which ran from May 2017 to April 2020. We contributed to normalization activity in the field of BRDF through the impact on measurements of parameters such as polarization.

MSL is now a partner in the EMPIR funded Joint Research Project “New quantities for the measurement of appearance” which runs from May 2019 to October 2022. We are contributing with measurements of BRDF, BTDF and sphere-based transmittance and haze measurements.

5. Are there any other research projects where you might be looking for collaborators from other NMIs or are there studies that might be suitable for collaboration or coordination between NMIs?

Digitalisation of the propagation of uncertainty for radiometric and photometric quantities.

6. Have you got any other information to place before the CCPR in advance of its next meeting?

reply

7. Bibliography of radiometry and photometry papers of your laboratory since the last CCPR (September 2019):

Gupta P, Fang F, Rubanov S, Loho T, Koo A, Swift N, Fiedler H, Leveueur J, Murmu P P, Markwitz A and Kennedy J 2019 Decorative black coatings on titanium surfaces based on hard bi-layered carbon coatings synthesized by carbon implantation *Surf. Coatings Technol.* **358** 386

Fang, F, Rogers, J, Leveueur, J, Robanov, S, Koo, A and Kennedy J 2020 Catalyst-free synthesis of copper oxide composites as solar radiative filters *Nanotechnology* 31 504002

Allen, M, Swift, N, Nield, K, Liley, B and McKenzie, R 2020 Use of Electronic UV Dosimeters in Measuring Personal UV Exposures and Public Health Education *Atmosphere* 11 774

Koo, A and Hall, B 2020 Linking an RMO or bilateral comparison to a primary CCPR comparison Callaghan Innovation Report No 0776 doi: 10.5281/zenodo.3958381

Hall, B and Koo A 2021 Digital Representation of Measurement Uncertainty: A Case Study Linking an RMO Key Comparison with a CIPM Key Comparison *Metrology* 1 166

Molloy E, Koo A, Hall B and Harding, R 2021 The statistical power and confidence of some key comparison analysis methods to correctly identify participant bias *Metrology* 1 52

Molloy E, Saunders, P and Koo, A 2022 Effects of rotation errors on goniometric measurements *Metrologia* **59** 025002