

## Questionnaire on activities in radiometry and photometry

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

Delegate: Annette Koo

1. Summarize the progress in your laboratory in realizing top-level standards of:
  - (a) broad-band radiometric quantities
  - (b) spectral radiometric quantities  
Spectral irradiance – lamps recalibrated at NIST, checks before and after showed drift in one lamp.  
Detector spectral responsivity 240 nm to 1000 nm – scale is current, however our cryogenic radiometer has a fault – if it is not repairable, we will be purchasing and installing a new one.
  - (c) photometric quantities  
Luminous responsivity/intensity – scale is current, we are in the process of building a new set of photometers, including design and manufacture of photopic filters and improved housing including temperature control based on heat pipes.
  - (d) spectrophotometric quantities  
Regular transmittance – finished K6 measurements as pilot in November 2015  
Diffuse reflectance – initial measurements to realize an independent scale have been made (gonio based system)  
Bidirectional R/T – participated in EMRP comparison of 0:45 on gonio system, results positive
2. What other work has taken place in your laboratory in scientific or technological areas relevant to the CCPR?  
  
MSL participated in an APMP study of transmittance haze. The documentary standards for this quantity have been shown to inadequately define the measurand and therefore comparability of measurements made according to the standard is poor.  
  
As pilot of CCPR K6.2010, MSL has developed capability in the understanding and analysis of comparison results and is contributing to WG-KC discussions to improve guidelines and recommendations around this.  
  
MSL has participated in the EMRP study of the PQED, calibrating it against our scale of detector responsivity.
3. What work in PR has been/will be terminated in your laboratory, if any, in the past /future few years? Please provide the name of the institution if it has been/will be substituted by a DI or accredited laboratory.

None

## Consultative Committee for Photometry and Radiometry (CCPR)

23<sup>rd</sup> Meeting (22 - 23 September 2016)

4. What are present, new or emerging needs of users of your services that are not being supported sufficiently by current CCPR activities or initiatives? In the light of this information please suggest desirable changes in the future working program of the CCPR.

MSL is starting to carry out photobiological safety measurements for clients. Some support for validation of results would be useful.

5. What priorities do you suggest for new research and development programmes at NMIs in the area of Photometry and Radiometry?
6. Are there any 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?

Photobiological safety

BTDF measurement

Diffuse transmittance reference materials

7. Have you got any other information to place before the CCPR in advance of its next meeting?
8. Bibliography of radiometry and photometry papers of your laboratory since the last CCPR (September 2014)?

J F Clare and A Koo Evaluation of Measurement Comparisons Using Generalised Least Squares: the Role of Participants' Estimates of Systematic Error *Comm Stats: Theory and Methods* **43** 4297-4307 (2014).

Neil Swift, MSL Technical Guide 34 : Spectral Mismatch of Illuminance Meters, June 2015, available at <https://msl.irl.cri.nz/training-and-resources/technical-guides>

A Koo, The measurement of light: 'the' candela and New Zealand's candela *New Zealand Science Review* **72** (2) p. 45 (2015).

A Koo, Can we measure appearance? Poster at NZ IEEE Instrumentation and Measurement Society 2014 Workshop, 24 - 25 November 2014, Auckland

F Shindo, The Challenges of LED-Based Light Testing and Measurements: an Overview and a New International Standard, oral presentation at The Metrology Society of Australasia (MSA) Conference, October 2015, Queenstown