Intercomparison of Spectroradiometric and Photometric Measurements of Light Emitting Diode Luminous Intensity

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Measurements of luminous intensity for different dominant wavelength Light Emitting Diode were made with five different spectroradiometers and two photometric sensors. Performance and cost of the spectroradiometers varied. Two scanning grating type and three fixed grating type with electronically scanned multi-element array detectors were used in the measurements. The same standard of spectral irradiance was used to establish the intensity scale readings of the spectroradiometers relative to the National Institute of Standards and Technology (NIST) scale. The two photometers consist of temperature stabilized silicon photodiodes with filters providing a close photometric filter match to the CIE 1931 Human eye response function. The photometers spectral responsivity and illuminance scales are known through direct calibrations at NIST. Inter-comparison of illuminance and calculated luminous intensity of the LED output shows large variations in the measured values.