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Realization of luminous flux unit lumen at National Metrology Institute of Turkey (UME)

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Keywords

luminous flux, lumen, integrating sphere, illuminance, characterization, uncertainty

Abstract

Luminous flux calibration facility with an integrating sphere has been installed at the National Metrology Institute of Turkey (UME) in order to realize lumen. A LabView-based computer-controlled electrical system has been developed to operate light sources and to control electrical parameters. Owing to the corrections of the sphere system, inner coating reflectance, spatial non-uniformity, self-absorption factor and interior temperature variations have been characterized. The overall uncertainty in luminous flux measurement has been determined with an uncertainty of 1.14% (k = 2) in the range between 5–5000 lm.