Second FRM4SOC Workshop on Calibration and Characterisation of Ocean Colour Field Radiometers

INTI Instituto Nacional de Tecnología Industrial

Secretaría de Industria y Comercio
Ministerio de Economía

INTI: National Metrology Institute of Argentina

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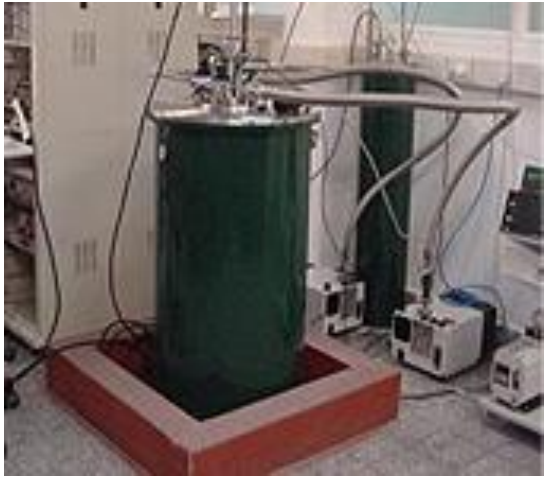

Radiometry and Photometry Laboratory

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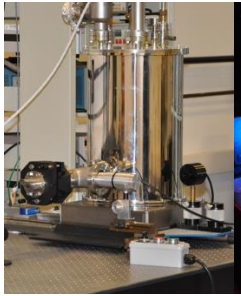
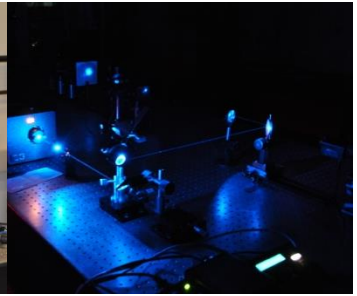
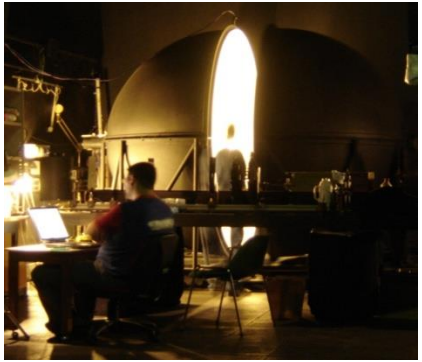
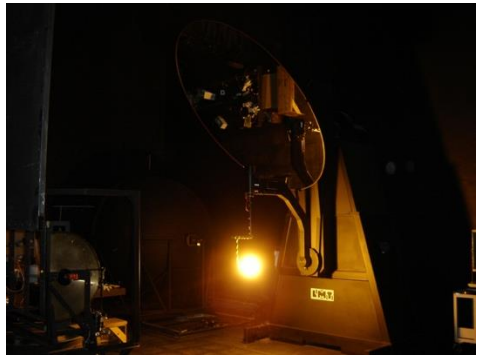
Realization of candela unit with our cryogenic radiometer





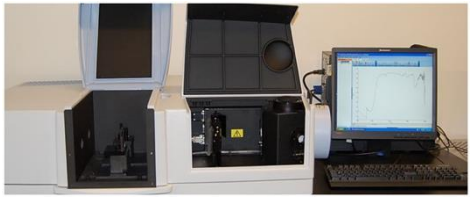
Photometric benchs and integrating spheres for photometric measurements





Gonio-photometric measurements

Spectro-radiometric measurements



Spectro-photometric measurements

OCR calibration capabilities

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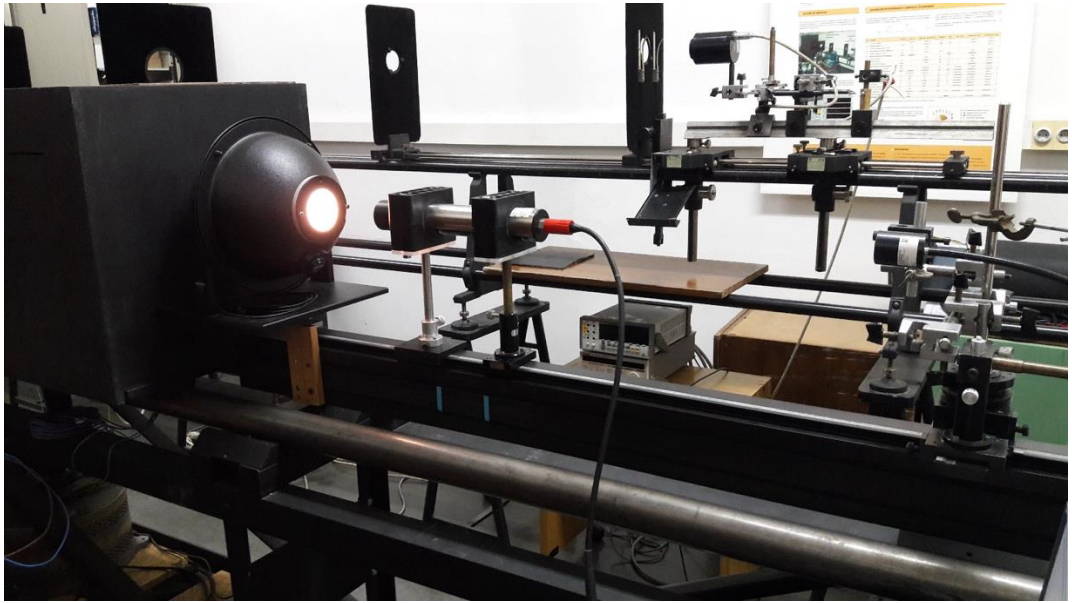
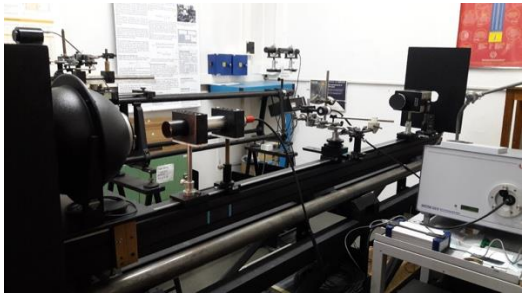
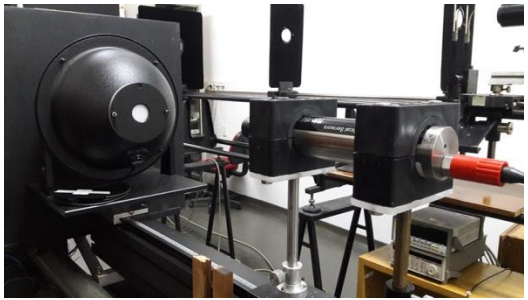
First tests using:

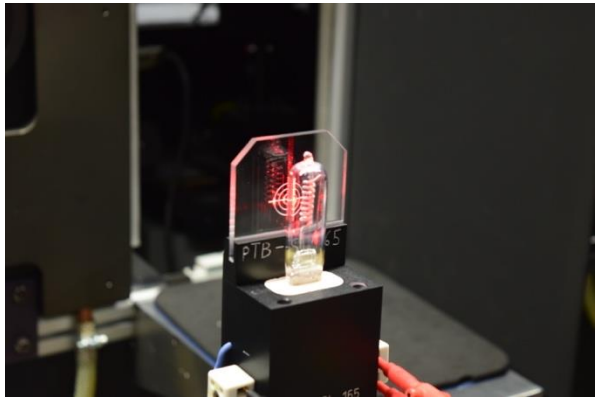
- Spectral irradiance standard lamps and photometric bench
- Integrating sphere with diffuser and calibrated area aperture
- Instrument Systems SPECTRO 320D double monochromator spectro-radiometer

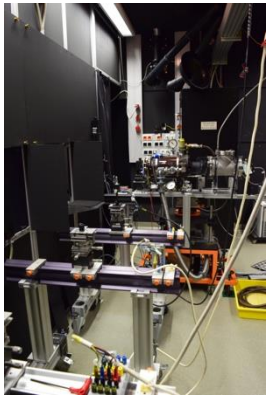






Traceability of radiometric scale





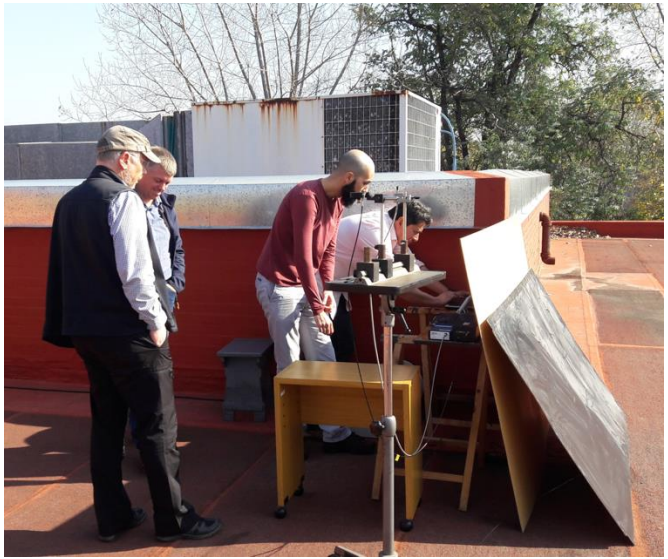
Halogen and deuterium spectral irradiance standard lamps calibrated against the black body in the PTB

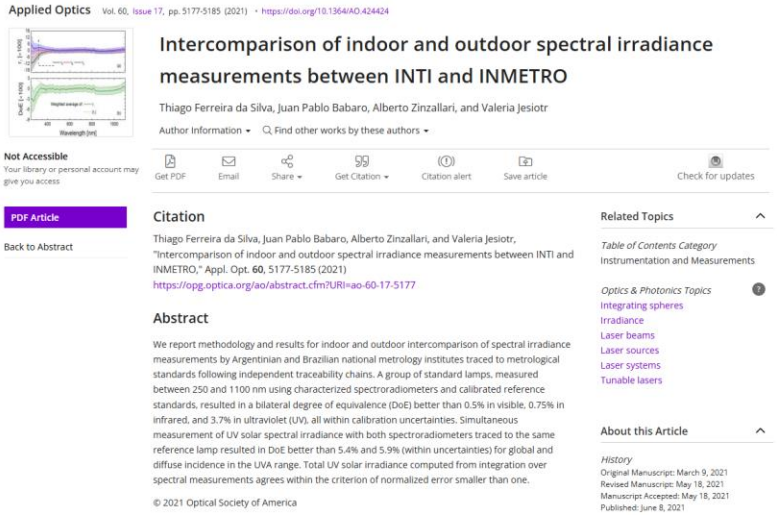
Reference spectro-radiometer:

Instrument Systems SPECTRO 320D double monochromator spectro-radiometer

Validation activities

- Workshop on spectral irradiance measurements held at INTI in 2019 with the participation of PTB, INMETRO and CENAM
- Unofficial intercomparison of indoor and outdoor spectral irradiance measurements between INTI and INMETRO – report published in scientific journal





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Intercomparison of indoor and outdoor spectral irradiance measurements between INTI and INMETRO

Thiago Ferreira da Silva, Juan Pablo Babaro, Alberto Zinzallari, and Valeria Jesiotr

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https://opg.optica.org/ao/abstract.cfm?URI=ao-60-17-5177

Abstract

We report methodology and results for indoor and outdoor intercomparison of spectral irradiance measurements by Argentinian and Brazilian national metrology institutes traced to metrological standards following independent traceability chains. A group of standard lamps, measured between 250 and 1100 nm using characterized spectroradiometers and calibrated reference standards, resulted in a bilateral degree of equivalence (DoE) better than 0.5% in visible, 0.75% in infrared, and 3.7% in ultraviolet (UV), all within calibration uncertainties. Simultaneous measurement of UV solar spectral irradiance with both spectroradiometers traced to the same reference lamp resulted in DoE better than 5.4% and 5.9% (within uncertainties) for global and diffuse incidence in the UVA range. Total UV solar irradiance computed from integration over spectral measurements agrees within the criterion of normalized error smaller than one.

Related Topics

Table of Contents Category
Instrumentation and Measurements

Optics & Photonics Topics
Integrating spheres
Irradiance
Laser beams
Laser sources
Laser systems
Tunable lasers

About this Article

History
Original Manuscript: March 9, 2021
Revised Manuscript: May 18, 2021
Manuscript Accepted: May 18, 2021
Published: June 8, 2021

Validation activities

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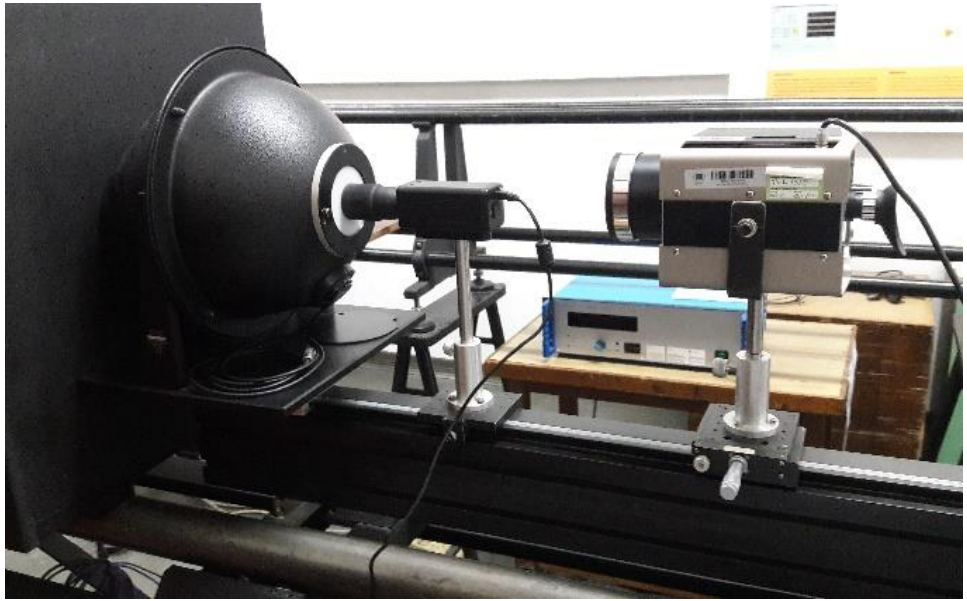
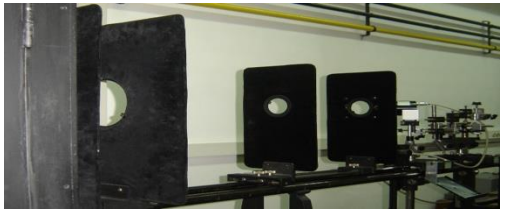
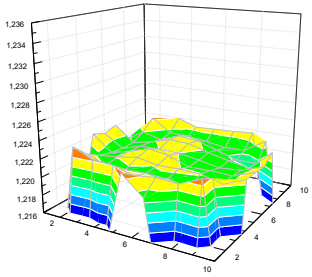
- Validation of spectral radiance measurements using our reference luminance meter calibrated with our luminous intensity standards and barium sulphate plate
- Characterization of our integrating sphere





Barium sulphate plate for luminance meter calibration



Spatial uniformity evaluation

Motivations, problems and challenges

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Motivations:

- Requiremens of calibrations from IAFE and INVAP
- Possilibity of offer calibration service to all the region

Problems and challenges:

- No experience with these calibrations and characterizations
- INTI has no CMCs in spectral irradiance and radiance declared at BIPM
- Need of comparisons with other institutes
- Lack of staff.

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Thank you!

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