



FRM4SOC LCE-2

Description of the comparison measurements

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Tõravere, 08.05.2017

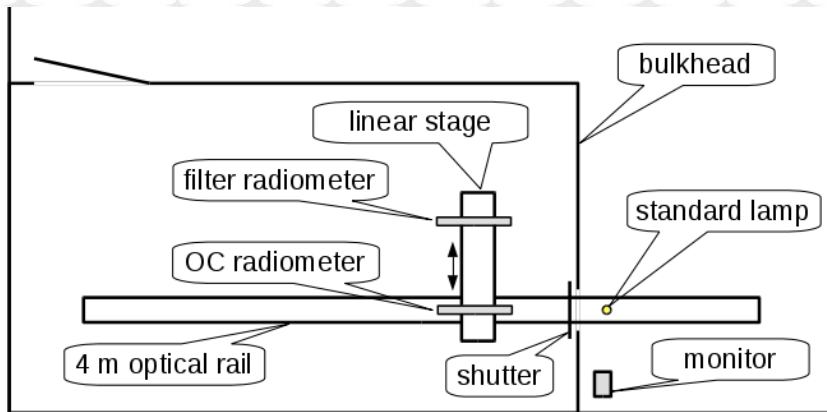
LCE-2 activities

- Radiometric calibration
 - irradiance
 - radiance
- Indoor intercomparison
 - irradiance (in 2 groups)
 - radiance (in 2 groups)
- Primary outdoor intercomparison
 - irradiance
 - radiance
- Secondary outdoor intercomparison
 - irradiance and radiance

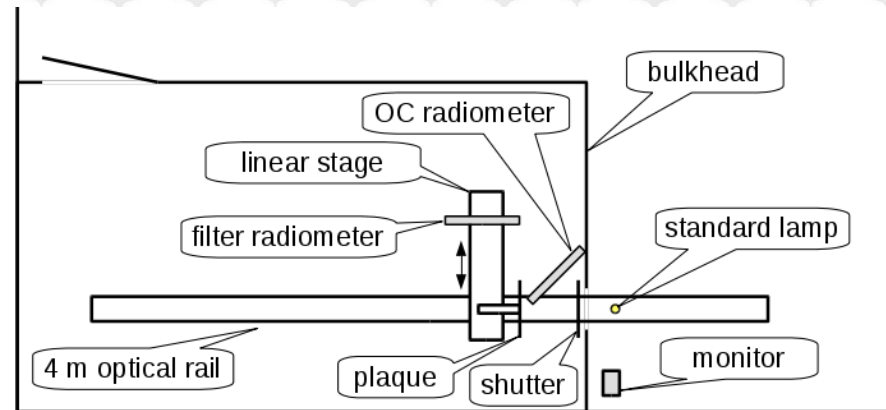
Radiometric calibration

FEL BN-9101-399, BN-9101-401 (NPL)

SphereOptics Zenith Lite SG3151
200x200 mm (TO)

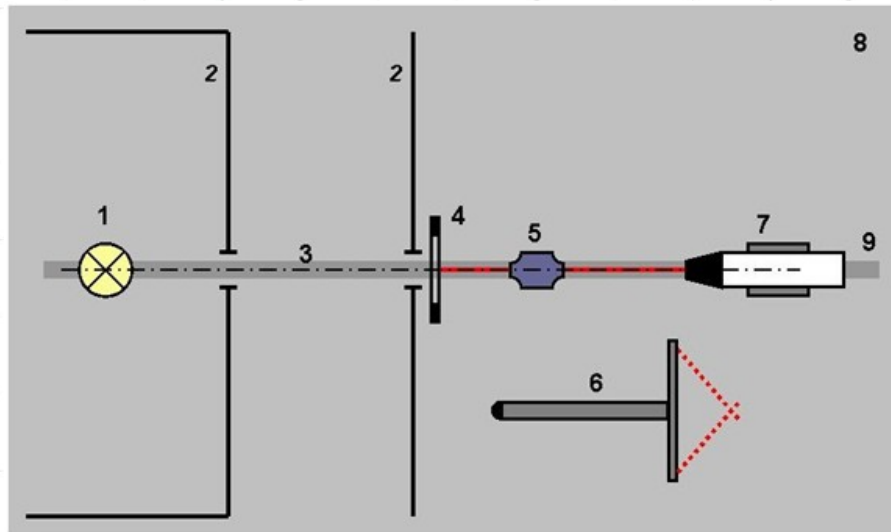


Irradiance



Radiance

Indoor intercomparison - irradiance



- 1 - FEL lamp
Osram Sylvania, 8.1 A
- 2 - baffles
- 3 - main optical axis
- 4 - alignment jig

- 5 - alignment laser
- 6 - distance tool
- 7 - radiometer on the support
- 8 - optical table
- 9 - optical rail



Reference
surface

- Distance to
- reference 500.0 mm
- lamp ~1 m

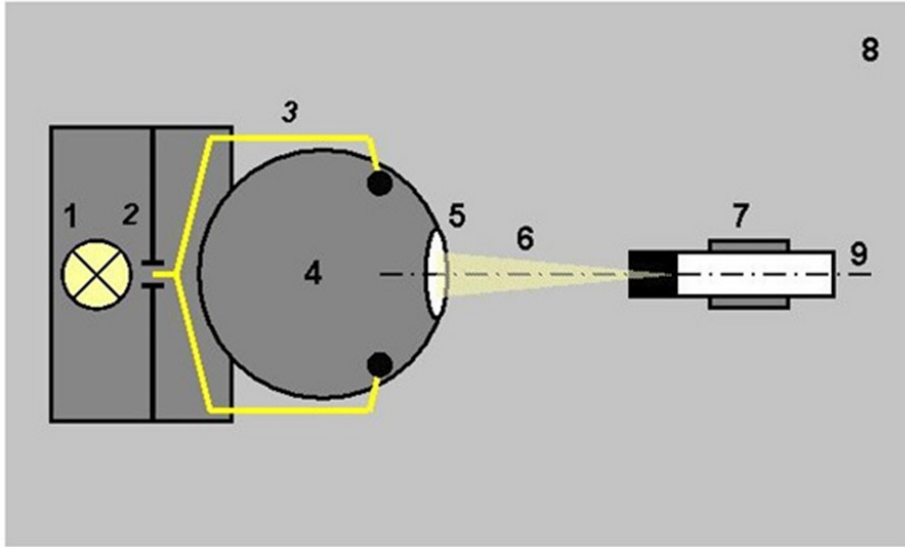
Alignment jig

Indoor intercomparison - irradiance

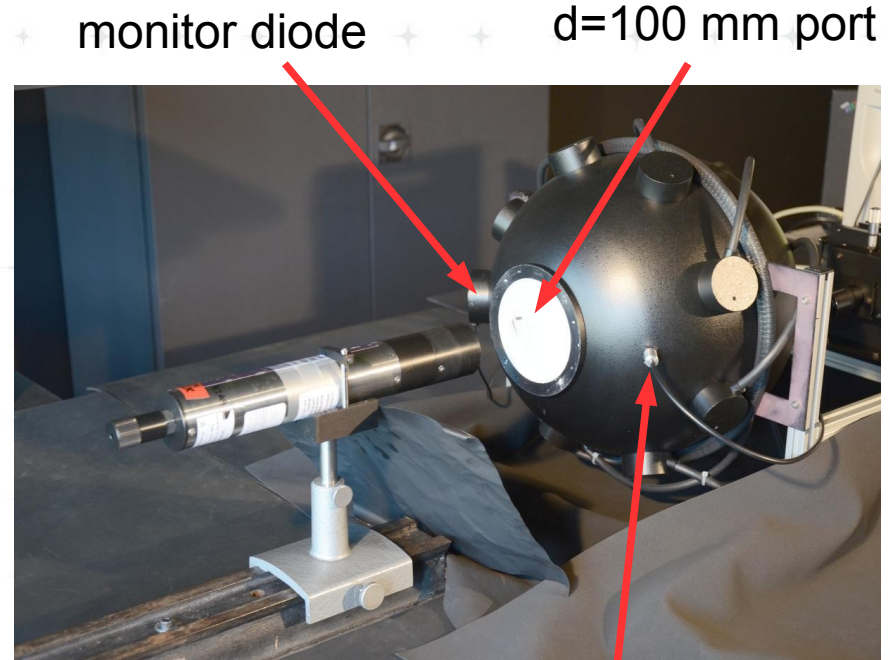
- 3 measurement series
 - align the instruments
 - collect 30 readings of target and dark signal at optimal integration time
 - repeat at about 2 times shorter integration time
- Intercompared quantity is spectral irradiance
- Each recorded value must be equipped with timestamp, integration time, and any necessary metadata
- If possible, record the raw values



Indoor intercomparison - radiance



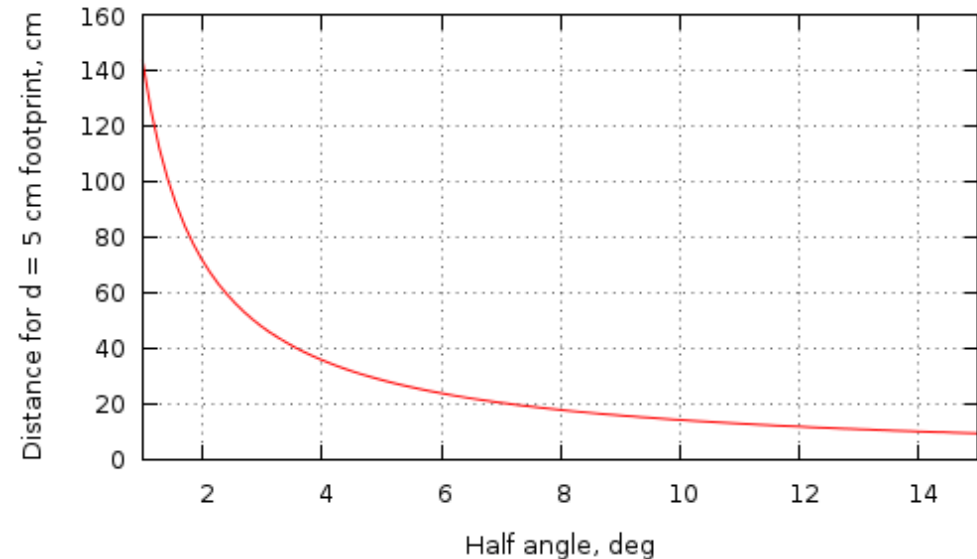
- 1 - quartz tungsten halogen lamp
- 2 - variable slit
- 3 - optical fibre
- 4 - integrating sphere
- 5 - output port
- 6 - FOV of the radiometer
- 7 - radiometer on the support
- 8 - optical table
- 9 - main optical axis



ASD FieldSpec Pro VNIR
monitor spectrometer

Indoor intercomparison - radiance

- Diameter of 100 mm output port of the sphere must exceed the footprint of the radiometer's nominal field-of-view by at least a factor of two



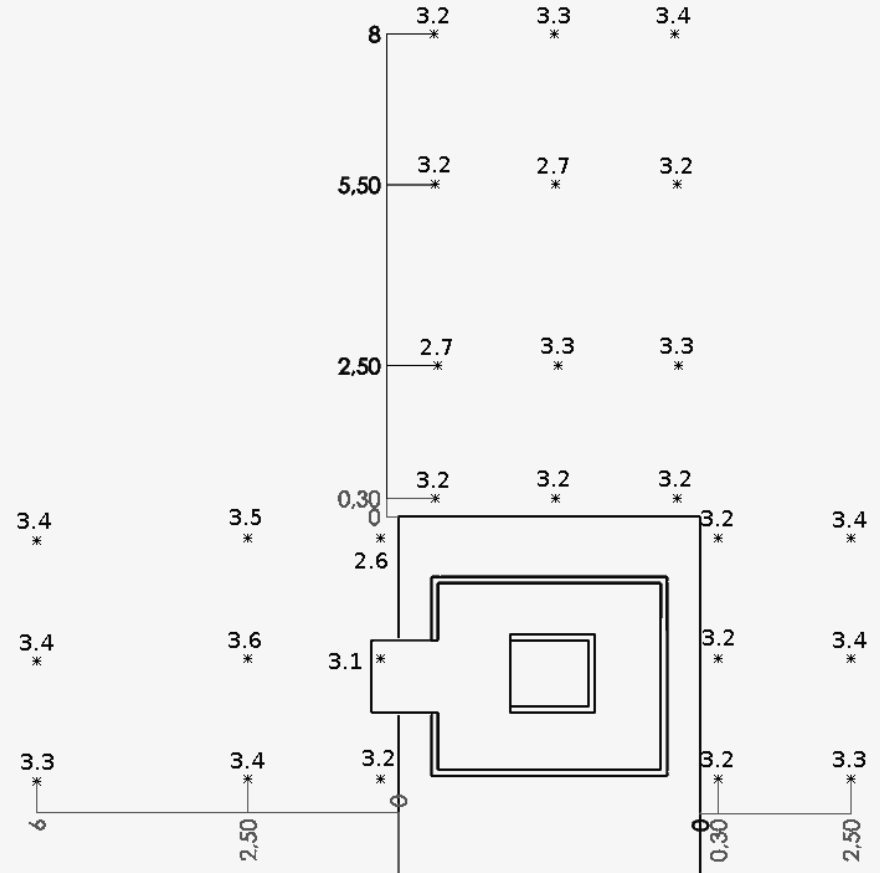
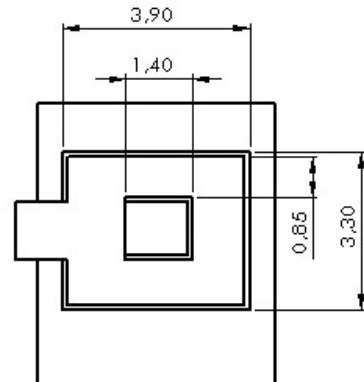
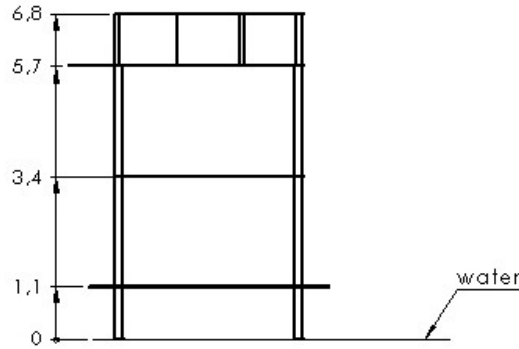
Indoor intercomparison - radiance

- 2 radiance levels based on monitor diode current
 - 3 measurement series
 - align the instruments
 - collect 30 readings of target and dark signal at optimal integration time
 - repeat at about 2 times shorter integration time
- Intercompared quantity is spectral radiance
- Each recorded value must be equipped with timestamp, integration time, and any necessary metadata
- If possible, record the raw values

Outdoor intercomparison - Kääriku

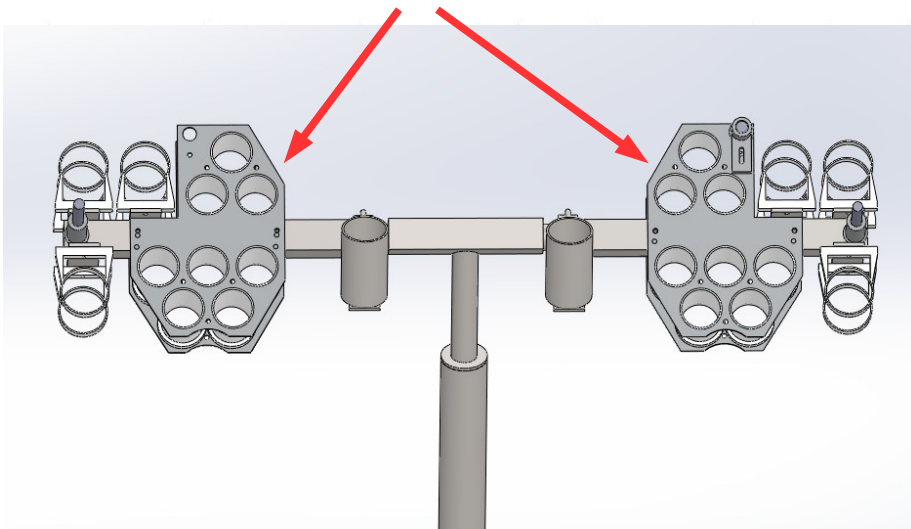


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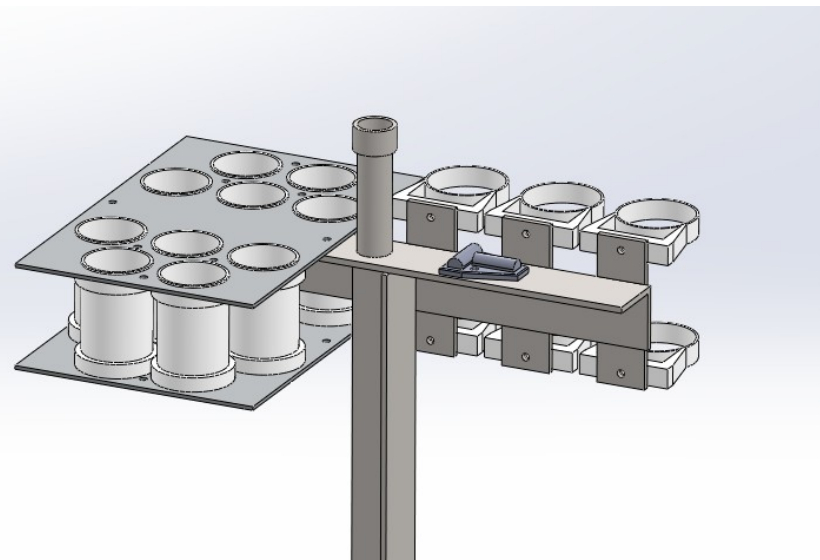


Primary outdoor intercomparison

Independent or common zenith pointing,
common azimuth pointing



Radiance frame



Irradiance frame

Primary outdoor intercomparison

- All the radiometers are mounted in a common frame
- Absolute spectral radiance of sky and water and downwelling global irradiance
- The sensors will be set up on the top level of the Kääriku tower
- The participants will
 - set up computers on lower levels of the tower, attach cables
 - synchronise clocks, verify that the setup is operational
 - collect data for 30 seconds upon notice by the key person operating the instrument frame
 - each recorded value must be equipped with timestamp, integration time, and any necessary metadata
 - If possible, record the raw values



Secondary outdoor intercomparison

- During the secondary outdoor comparison, each participant is responsible to set up both the radiometers (using their usual fieldwork configuration) and the logging equipment.
- If the participants don't have a frame for mounting the instruments, the frame of the primary outdoor experiment can be used.
- The intercompared products will be
 - water-leaving absolute spectral radiance
 - downwelling global absolute spectral irradiance
 - remote sensing reflectance of water



Thank you!