

SI-traceable Laboratory inter-comparison experiment LCE – 2

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Overview of LCE-2

- LCE-2 took place in Tartu Observatory, Estonia on 8-13.05.2017 and consisted of three sub-tasks
 - 1) SI-traceable radiometric calibration of all participating radiometers just before the start of comparison measurements (done by TO using a set of calibration standards provided by NPL) 02. – 07.05.2017
 - 2) indoor intercomparison of measuring stable radiance and irradiance sources in controlled environment 09. – 10.05.2017
- outdoor intercomparison over terrestrial water surface 11. – 12.05.2017
 - primary intercomparison - radiance, irradiance
 - secondary intercomparison - water-leaving radiance, remote sensing reflectance

Venue

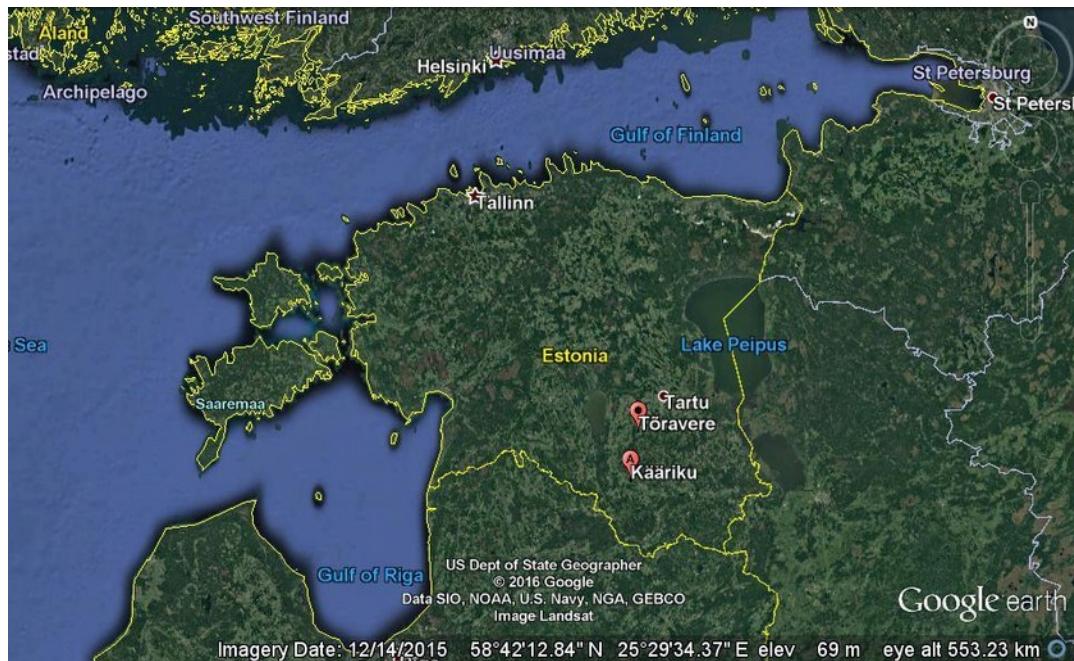


fiducial reference
measurements for
satellite ocean colour



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Calibration of sensors and indoor experiment - Tartu Observatory, Tõravere



Outdoor experiment - Lake Kääriku



Participants

Participant	Acronym	Country	Contact person
Tartu Observatory (pilot)	TO	Estonia	Joel Kuusk
Alfred-Wegener-Institut	AWI	Germany	Sonja Wiegmann, Tilman Dinter
Royal Belgian Institute of Natural Sciences	RBINS	Belgium	Kevin Ruddick
National Research Council of Italy	CNR	Italy	Claudia Giardino, Mariano Bresciani
University of Algarve	CIMA	Portugal	Davide D'Alimonte
University of Victoria	UVIC	Canada	Maycira Costa
Satlantic; Sea Bird Scientific	Satlantic	Canada	Ronnie Van Dommelen
Plymouth Marine Laboratory	PML	UK	Gavin Tilstone
Helmholtz-Zentrum Geesthacht	HZG	Germany	Henning Burmester
University of Tartu	UT	Estonia	Birgot Paavel
Cimel Electronique S.A.S	Cimel	France	Bahaiddin Damiri





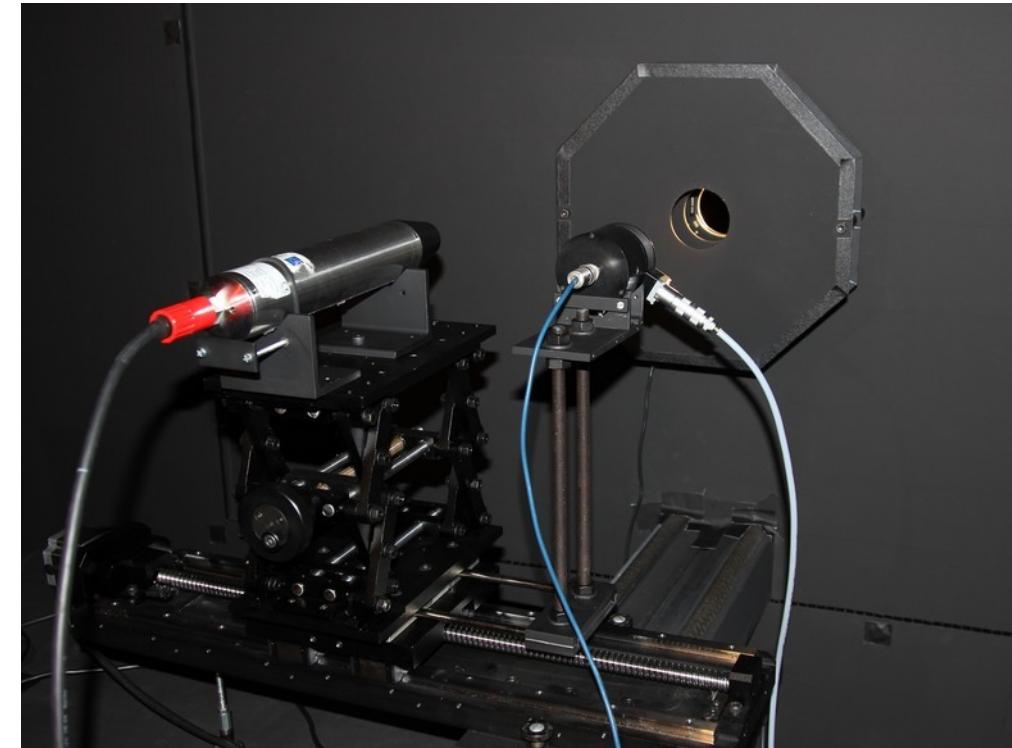
Radiometers



Radiance: 16 RAMSES, 6 HyperOCR, 6 other
Irradiance: 10 RAMSES, 3 HyperOCR, 3 other

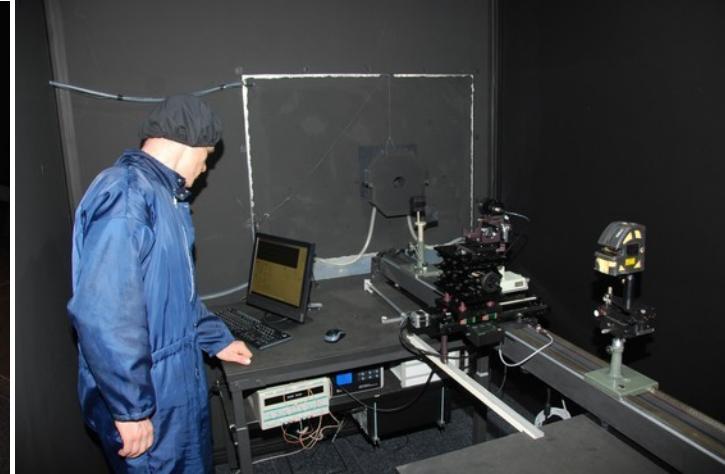
Participant	Sensor type
TO	RAMSES: 2 radiance, 1 irradiance, WISP3 (2 radiance, 1 irradiance)
AWI	RAMSES: 2 radiance, 2 irradiance
RBINS	RAMSES: 7 radiance, 4 irradiance
CNR	SR-3500 (1 radiance, 1 irradiance), WISP3 (2 radiance, 1 irradiance)
CIMA	RAMSES: 2 radiance, 1 irradiance
UVIC	HyperOCR, 2 radiance 1 irradiance
Satlantic	HyperOCR, 2 radiance 1 irradiance
PML	HyperOCR, 2 radiance 1 irradiance
HZG	RAMSES: 2 radiance, 1 irradiance
UT	RAMSES: 1 radiance, 1 irradiance
Cimel	SeaPRISM (1 radiance)
In total	28 radiance and 16 irradiance sensors

Radiometric calibration - irradiance



The laboratory

- Optical radiometry laboratory of Tartu Observatory
- ISO 14644-1 class 8 cleanroom (FED STD 209E equivalent class 100 000), roughly 10 times cleaner than regular office air
- 3 rooms - preparation, radiance experiment, irradiance experiment





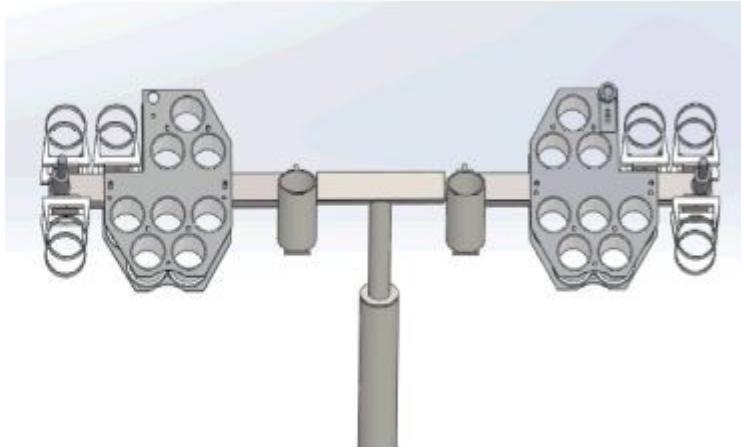
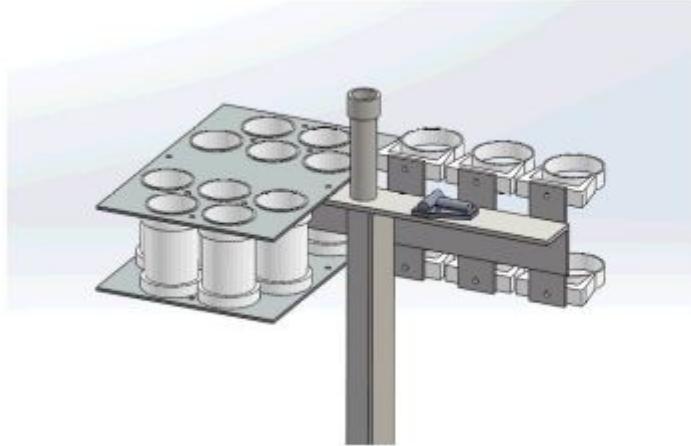
The outdoor experiment



Main differences between indoor and outdoor experiments

- Ambient temperature was roughly 15 °C lower than during the radiometric calibration of the radiometers
- Spectral composition of the target signal (sky, water) was different compared to the radiometric calibration standard (incandescent source)
- The angular distribution of downwelling irradiance was significantly different than during radiometric calibration (normal illumination)
- Due to variable nature of natural illumination it was not possible to measure the targets using different integration times

The purpose-built instrument frames



Thank you!



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