Pre-flight Cal Workshop

CEOS Committee on Earth Observation Satellites

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Workshop on Optical Space Sensor Pre-flight Calibration and Characterisation

Event Dates: November 19th - 21st, 2024

@ESA ESTEC Netherlands

Save the Date!

19-21 November 2024

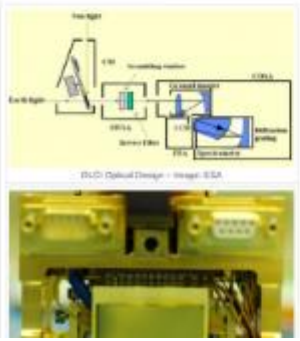
Location: ESA-ESTEC, Noordwijk, the Netherlands

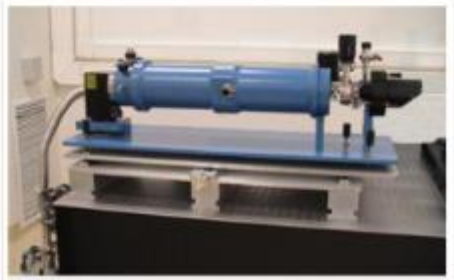
It's time to block your calendars to make sure you don't miss out on the CEOS-WGCV and CGMS-GSICS Workshop on Optical Space Sensor Pre-flight Calibration and Characterisation, which is set to take place from 19-21 November **2024** at ESA-ESTEC (Noordwijk, the Netherlands).

Register your interest here!

Over the next decades an ever-increasing demand for Earth Observation data is foreseen to meet the demanding needs of climate science and operational monitoring of the planet, across land, ocean and atmospheric domains. These demands will be met by a combination of traditional civil space agency missions and commercial / institutional low-cost micro/nanosatellites, spanning the electromagnetic spectrum. The rapid emergence of space-based Greenhouse Gas monitoring missions and hyperspectral imagers and their application to the 'net zero' agenda has further grown the EO landscape.

While ensuring and quantifying the performance of all types of sensors is demanding, those operating in the optical domain present a particularly large range of challenges. However, it is also a domain where there have been many recent advances in the





NPL Primary Standard cryogenic radiometer

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SCOPE

All optical sensors primarily solar reflective domain <~2500 nm Possible TIR

Pre-flight satellite & On-board cal systems (pre-flight)

Radiometric/Spectral Cal and characterisation

- All aspects impacting e.g. stray light, linearity. Gain…etc

For whom?

- Engineers/scientists
- Science Pis
- To some extent managers/funders

Format?

- Some ‘Invited’ presentations + followed by discussion?
- Call for poster and oral (Spring 2024)
- 3 days all plenary

Output

- Proceedings and Citeable guidance doc on good practises within a year

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Session 1: Introduction, objectives, drivers

- Workshop introduction
- Principles of Calibration/Characterisation/traceability/uncertainty
- Cal/Characterisation needs (now and future) for land imaging applications (SR)
- " " " Ocean imaging applications (SR)
- *" " " Land/Ocean imaging applications (TIR) - option*
- " " " Atmospheric imaging (spectrometers) (SR)
- *" " " Atmospheric imaging (spectrometers) (TIR) - option*
- Discussion and identification of key requirements and drivers.

Session 2: Spectral response function/bandwidth/wavelength/smile (UV-SWIR)

- Cal/Characterisation of spectral filter based systems (10s nm bandwidth)
- " Spectrometers (nm's bandwidth)
- " spectrometers (<nm bandwidth)
- " 'out of band' stray light
- " Sensitivity to polarisation
- New methods
- Discussion

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Session 3: Stray light (out-of-field), Point spread function, Ghosts, scattered (UV-SWIR)

- Characterisation of stray/scattered optical radiation SR domain
- *“ “ TIR domain - option*
- New methods
- Discussion

Session 4: Radiometric gain/linearity (UV-SWIR)

- Calibration of radiometric gain including standards and traceability
- Cal/Characterisation of sensor dynamic range/non-linearity
- Cal/Characterisation (and design?) of on-board monitoring systems
- New methods
- Discussion

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Session 6: Radiometric gain/linearity (TIR) (possibly not include) - option

- *Calibration of radiometric gain including standard and traceability*
- *Cal/Characterisation of sensor dynamic range/non-linearity*
- *Cal/Characterisation (and design?) of on-board monitoring systems*
- *New Methods*
- *Discussion*

Session 7: Workshop summary/Recommendations/priorities/Next steps

- Discussion of conclusions from previous sessions
- Priority topics
- Formation of expert teams
- Discussion on future transparency of pre-flight characteristics

Organisation

Core CEOS/GSICS workshop implementation team

Nigel Fox, NPL/UKSA (UK)
Phillipe Goryl, ESA/ESRIN (Italy)

Jean-Marc Laherrere, CNES (France)

Christoph Straif, EUMETSAT (Germany)
Albrecht von Bargen, DLR (Germany)

Fred Wu, NOAA (USA)
Jack Xiong, NASA (USA)

Seeking to establish scientific committee ~ 20-30:

- Representing globe- industry and agency
- Define detailed program/session/contributions
- Core writing team of good practises