Summary for breakout workshop #8 at IOCS 2019: Ocean Color Satellite Sensor Calibration

Chair: Gerhard Meister, NASA

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Background: IOCCG Task Force 'Ocean Colour Satellite Sensor Calibration'

- The task force has been using the IOCS meetings as opportunities to meet

- Mission Statement of the task force:

  The goal of the Satellite Sensor Calibration Task Force is to create a framework for active and hands-on collaboration among instrument calibration and characterization experts from Agencies engaged in the OCR-VC initiative. The collaboration focuses on calibration needs specific to ocean-colour measurements and has the objective to maximize the accuracy and temporal and spatial stability of OCR records from individual missions for the purpose of climate, research and operational applications.

Agenda:

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- 9:30 Gerhard Meister: Introduction
- 9:35 Gerhard Meister: Calibration program for the Ocean Color Instrument (OCI) on the PACE mission
- 9:50 Jack Xiong: JPSS-2 VIIRS pre-launch calibration and characterization
- 10:05 Ludovic Bourg: OLCI-B straylight correction performance assessment using Moon observation
- 10:20 Shihyan Lee: Estimating straylight impact on ocean color products based on point-spread functions
- 10:35 Kibeom Ahn: GOCI-II lunar calibration and MTF plan
- 10:50 Menghua Wang: NOAA VIIRS calibration: impact on ocean color products
- 11:05 Break
- 11:15 Hiroshi Murakami: Radiometric calibration of SGLI on-orbit
- 11:30 Xianqiang He: On-orbit performance of the HY-1C/COCTS
- 11:45 Ewa Kwiatkowska: Sentinel-3 OLCI in flight diffuser characterization
- 12:15 Ludovic Burg: OLCI-A and OLCI-B cross-calibration using the tandem-flight period

Meeting structure

- In the past, the format (talks with ensuing discussion) has worked out well
- This time, both talks and discussions took much longer than planned
- Plan more time for discussion next meeting
- Recommendations presented in the following slides are not vetted by the whole group

Recommendation #1

- Every mission should evaluate if lunar observations can be acquired at least infrequently (for gain corrections and/or straylight evaluation)
- ESA presented preliminary results of a straylight analysis of the first OLCI-B lunar measurement
- Results are extremely useful for evaluating the accuracy of the current OLCI straylight correction and may lead to improved correction algorithms/coefficients
- 1020nm correction is affected the most

Recommendation #2

- Every mission should evaluate if for a newly launched sensor, a tandem flight (preferably with a similarly or better calibrated sensor) is possible
- A tandem flight is where one sensor follows the other in orbit closely
- ESA presented preliminary results on the OLCI A/B tandem flight
- Analysis is not as straightforward as one might think
- Results confirm previous studies and provide higher reliability

Recommendation #3

- The gain calibration trends should not contain discontinuities that are not clearly supported by calibration measurements
- If erroneous discontinuities do occur, they should be replaced by continuous trends in a timely fashion
- NOAA presented results that showed the first 3 months of 2018 currently should not be used for VIIRS-NOAA-20 ocean color processing because of this issue

Recommendation #4

- Characterization of diffuser standards requires high standards of radiometric uncertainty analysis
- Calibration providers should provide supporting evidence regarding the uncertainty of the diffuser BRDF measurements (e.g. round-robins, repeated measurements, etc.)

Recommendation #5

- Evalute approach to masking and flagging around clouds
- Masking and flagging around clouds drives global coverage
- Current NASA MODIS/VIIRS flag is probably too conservative
- Introduction of per pixel uncertainties could potentially be used to decide how much impact to accept

Thanks for your attention!