Fiducial Reference Measurements for Satellite Ocean Colour (FRM4SOC)

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Welcome and Overview

- Welcome to ESRIN
- Background
- Quick status on S3B and S2B
- FRM4SOC
- Aim and Objectives for this workshop
The Copernicus Sentinel Deployment Schedule

- The S2 & S3 missions include 4 satellites.
- Even though S2/3A and S2/3B are practically identical in design, it is anticipated that differences in performance of payload instruments will exist.
- It is essential that relative (absolute) bias between S2/3A/B/C/D instruments are known properly for Climate Data Record construction.
- SVC is required throughout the multi-mission time series.

Legend:
- Qualification Acceptance Review (QAR)
- Flight Acceptance Review (FAR) or Pre-Storage Review (PSR)
- On-ground Storage
- Tentative launch date
- In-orbit Commissioning

Status: 22 March 2016
Sentinel-3B: status

- Sentinel-3B FAR planned for Sept-Oct 2017, still compatible with a launch before end 2017
- OLCI-B model suffered major anomaly (repeat of anomaly which affected the A instrument) during Instrument TVAC in July 2016 - Decision to refurbish all 5 cameras, with new gluing process.
- Delivery of OLCI-B for S/C integration by mid June 2017
- Flight Acceptance Review – October 2017
- Launch on Rockot from Plesetsk in late 2017.
Sentinel-2B launch preparations

Sentinel-2B and VEGA are both GREEN for launch on the 6th March 01:49 GMT (02:49 CET) on 7 March.
### Band Set of OLCI&MSI in the Visible and the Near Infra-Red

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(Credit: OC_cci, S. Sathyendranath)

- Higher spectral resolution than all previous sensors: Important for atmospheric correction, complex coastal waters, phytoplankton types
- Consistency with MERIS: facilitates merging (no need to do band-shifting to establish inter-sensor biases)
OCR Time Series: Daily coverage: gaps in daily coverage with single sensor

- Need two to three sensors to minimise gaps in daily coverage, and to reduce noise
- Promise of Sentinel: at least two sensors in constellation mode when Sentinel 3A and 3B are in orbit
- Current status: OC-CCI time series reliant solely on old sensor MODIS-A. VIIRS under evaluation.
Aim **To establish and maintain SI traceability of Fiducial Reference Measurements (FRM) for satellite ocean colour radiometry (OCR).**

- Laboratory and field radiometer characterization experiments
- Laboratory comparison of radiance and irradiance sources
- Laboratory round-robin performance assessment of field OCR used for satellite validation
- Workshop to establish requirements for European OCR vicarious adjustment infrastructure

[https://frm4soc.org/](https://frm4soc.org/)
Workshop Aim and Objectives (1/2)

By the end of this workshop we should have:

*Evaluated options for future European satellite OCR vicarious adjustment infrastructure (including approaches and value for money) for the Sentinel-3 OLCI and Sentinel-2 MSI A/B/C and D instruments.*
Workshop Aim and Objectives (2/2)

• Foster an open-forum, wide-ranging debate with the international ocean colour community;
• Review of historical and contemporary approaches to vicarious adjustment;
• Document Lessons Learned from international teams;
• Review the strengths and weakness of alternative methods and approaches to OCR satellite vicarious adjustment;
• Consider an optimum European location for OCR vicarious adjustment infrastructure based on spatial and temporal distributions of Chl, atmospheric aerosol loading and cloud cover (and other geophysical quantities if deemed appropriate);
• Conclude with a consensus on the way forward to deliver the best scientific outcomes to support long-term Copernicus operations using European infrastructure S3 and S2 OCR vicarious adjustment infrastructure;
• Review the costs to implement, operate and maintain a European satellite OCR vicarious adjustment infrastructure for S3 and S2 missions;
• Write a workshop report: “Requirements and recommendations for infrastructure required for the long-term vicarious adjustment of the Sentinel-3 OLCI and Sentinel-2 MSI A/B/C and D instruments” building on the workshop and any other source that is relevant to the definition of an optimal European infrastructure.
• Review and define justified and traceable requirements for vicarious adjustment measurements (ie. instruments) to be made in support of satellite OCR;
EUMETSAT Companion activity
September 2016 to July 2017

• Parallel study by EUMETSAT: "Requirements for Copernicus Ocean Colour Vicarious Calibration Infrastructure".

• Detailed requirements for Ocean Colour Vicarious Calibration Infrastructure for the European Commission's Copernicus Programme

• A review process for the requirements document.

• The objective is to generate a complete scientific, technical and operational requirements document that will be a deliverable to the European Commission's Copernicus Programme

• Can be used as a traceable reference for all steps and aspects of vicarious calibration infrastructure design, development and operations.
Conclusions

• Please use the time together in the best way possible
• Please don’t see this workshop as a means to confuse existing activities
• This is not a competition!
• We are trying to establish a rationale for investment into OCR
• We need your help to articulate the requirements in a justified and meaningful manner with respect to the Copernicus Sentinels
• It’s a great opportunity to develop the international consensus
• Thanks to Christophe and FRM4SOC team
• Thanks for your help and for your time.

Boussole: Chl ~ 0.05 mg m$^{-3}$ from 35m (March 2006) D. Antione
Thank You – any Questions
Contact: Craig.Donlon@esa.int