



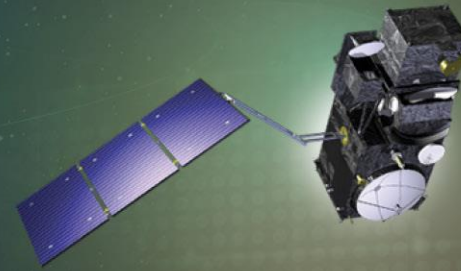
PROGRAMME OF THE
EUROPEAN UNION



co-funded with



Activities towards improving Ocean Colour OLCI algorithms and products and facilitating validations



7th Sentinel-3 Validation Team Meeting 2022

18-20 October 2022 | ESA-ESRIN | Frascati (Rm), Italy

Ewa Kwiatkowska
EUMETSAT

Following the S3VT recommendations

Collection-3 OLCI Ocean Colour feedback from S3VT-OC 2020

- Remaining problems with the Standard Atmospheric Correction
 - As a result, the radiometry is performing poorer over complex waters, particularly in the CDOM-dominated waters
 - Causing geometry dependences in products (viewing and solar), which are showing as product biases, e.g. across track
- BRDF correction is needed, suitable for all water types
- Remaining pixel flagging limitations, high-chlorophyll limitations, additional user products needed

Redevelopment of Standard Atmospheric Correction (OC-SAC)

- <https://www.eumetsat.int/oc-sac>
- → Constant Mazeran presentation in the OC session

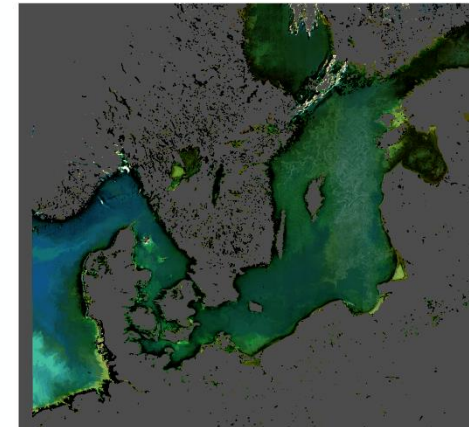
Development of BRDF correction for complex and clear waters

- <https://www.eumetsat.int/brdf-correction-s3-olci-water-reflectance-products>
- → Davide D'Alimonte presentation in the OC session

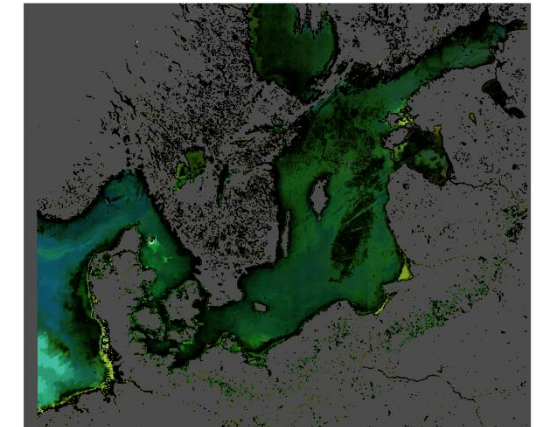
New demonstration test products available: IOPs, Fluorescence

“In summary, much progress but still *room for improvements*”

solvo
OC-SAC first results

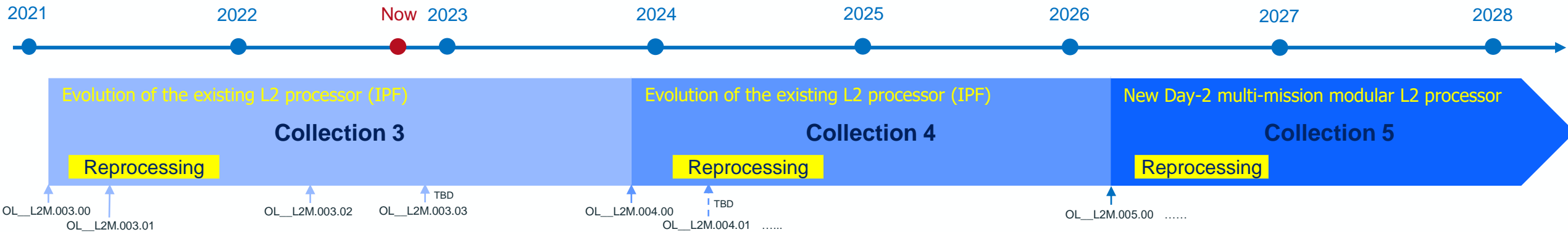


HYGEOS
OL__L2M.003.01



Reference BRDF
M02, L11, P05,
H17, T18

Tentative scope and timeline of L2 Ocean Colour processing evolutions



OC-SVC new standardised System Vicarious Calibration gains
Baseline Atmospheric Correction processing chain (clear waters)

- Updated Bright Pixel Correction
- New Chlorophyll Index algorithm for oligotrophic waters
- Spectrally-resolved whitecap correction introduced

Alternative Atmospheric Correction processing (NN complex)

- New Neural Network v.2
- Updated TSM scaling to allow retrievals to 400 g/m³

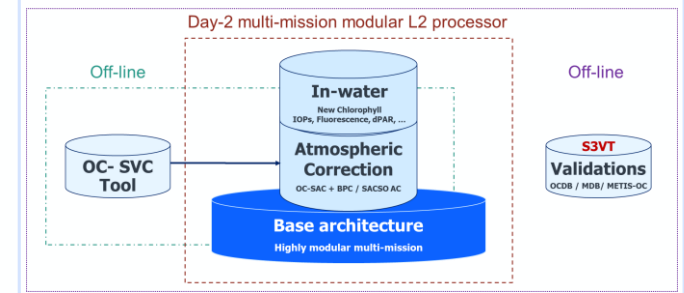
Flags

- New additional test for CLOUD_AMBIGUOUS
- OC4ME_FAIL update to allow chlorophyll to 100 mg/m³
- New flags: COASTLINE, TURBID_ATMOSPHERE
- Updated definition of ANNOT_DROUT, ADJAC

<https://www.eumetsat.int/media/47794>

OC-SAC major atmospheric correction improvement
BRDF of water reflectance
IOPs, Fluorescence new products, if validated
daily-PAR, if successful
Other product and flag improvements
WV move to a dedicated OLCI Atmospheric dataset
L2 uncertainty propagation from L1 to L2

Next generation atmospheric correction
Product and flag consolidation
New L2 products



All developments are implementing individual pluggable processing modules

Seeking S3VT-OC support in validations of Collection-4 developments before the operational deployment

Evolution of the existing L2 processor (IPF)

Collection 4

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EUMETSAT will process OLCI data with Collection-4 test algorithms

- Processing data for your selected locations and times, or for the list of granules
- Receiving your validation feedback

Validation feedback will be used to update or refine the test algorithms

Validation feedback will be used to decide whether new test products are moved to Collection-4 operations (IOPs, Fluorescence...)

Validation activities starting early 2023, but some inputs now available e.g. IOPs

Please let us know if interested in supporting this effort

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Aiming to provide to S3VT easy procedures, guidelines and tools to collect FRM-quality in situ measurements and to facilitate validations

Easy to follow procedures, field instrument Cal/Char info, Community Processor, full Uncertainties, In situ Database, Data Extraction and Validation Scripts



Main *published* contributions from:

- Astrid Bracher (AWI)
- Daniel Odermatt (EAWAG)
- Julia Uitz (LOV)

Coming soon: HYPERMAQ dataset 😊

Automated matchups (download co-located OLCI data, perform extractions, compute matchup statistics)

→ only need to adapt your in situ data to OCDB/SeaBASS format (BTW you can submit your data to OCDB to check whether format is compatible 😊)

Still, Ocean Colour in situ measurements for operational validations are sparse, e.g. current OLCI validation is primarily based on AERONET-OC data

Many Optical Water Types are rarely or almost not sampled

1. How to support you in collecting quality in situ validation measurements?

2. How to encourage or help you to share in situ validation measurements?

Further questions to S3VT Ocean Colour

Tentative launch of S3C is the launch window Nov 2024 – Apr 2025

- Current planning is to put one of the satellites S3A or S3B in standby, most likely S3A
- Is there any specific need for continuing the operations of the third satellite?
- E.g. in a different orbit to fill the gaps in the daily coverage between the other two satellites?

OLCI L1 and L2 RR products are distributed in half-orbits and FR products are distributed as 3-min granules

- Original OLCI L0 instrument granules are 2 min
- Would it be suitable to move to distributing L1 and L2 RR and FR products in 2 min granules?

TSIS-1 Hybrid Solar Reference Spectrum – Coddington et al. 2021

- <https://doi.org/10.1029/2020GL091709>
- The new Solar Spectrum has been recommended by CEOS and GSICS
- Should we switch from Thuillier 2003 to Coddington 2021?