VALIDATION OF SENTINEL-3A OLCI PRODUCTS USING A COMBINATION OF MOORING, PROFILING FLOAT AND SHIP OBSERVATIONS

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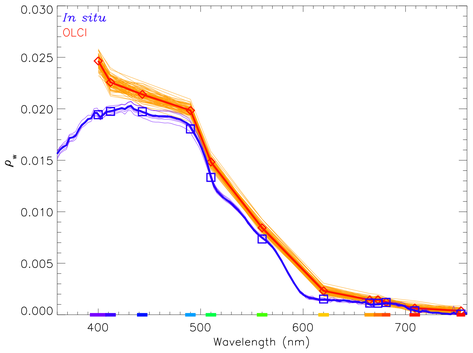
ABSTRACT

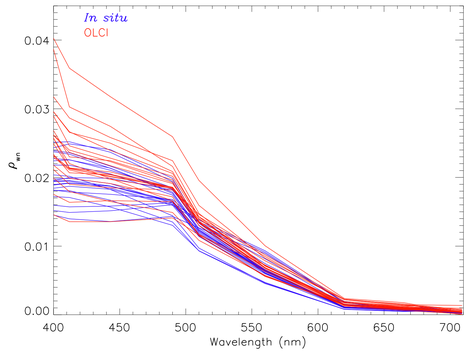
On February 16th 2016 the **Sentinel-3A** satellite (S3A) was successfully launched into orbit by the European Space Agency (ESA), as part of the European Commission's (EC) Copernicus program and entered the commissioning phase. This 5-month phase is dedicated to verification of satellite and instruments functioning, validation of L1 products and a preliminary quality assessment of L2 products. On board the S3A, the Ocean and Land Colour Instrument (**OLCI**) will be the first Ocean Colour instrument to provide users with global coverage at 300 m resolution. The present work aims at contributing to the initial assessment of OLCI L2-water products validity and quality by means of a combined validation data set of radiometric measurements built with mooring and ship observations at the **BOUSSOLE** site in the NW Mediterranean Case I waters and from a profiling float deployed in the same area.

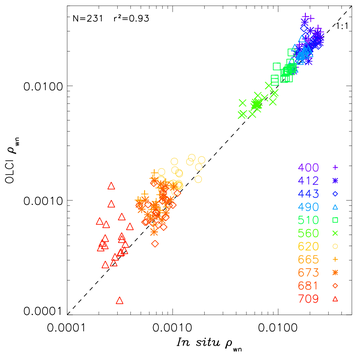
MOORING

The BOUSSOLE mooring (left picture) is permanently deployed in the Case I waters of the NW Mediterranean Sea (43°22'N, 7°54'E, 2240 m depth).
Radiance reflectance (ρ_w or ρ_{wn} after normalization) data shown here were derived from a set of Satlantic HyperOCR radiometers mounted at surface (Es), 4 m and 9 m depth (Lu).

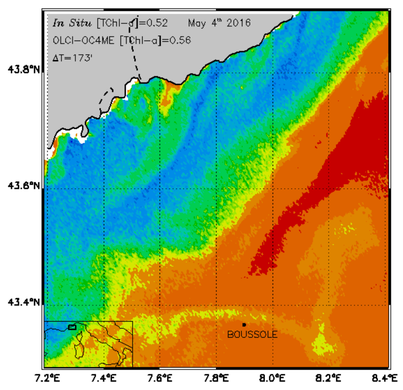


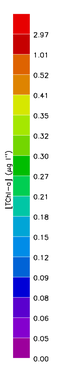
OLCI match-up points were averaged over a 9x9 FR pixels grid centered on the mooring location. *In situ* match-up were averaged ± 30 minutes around the closest satellite overpass, corresponding to 5 QCed spectra, and spectrally weighted for the OLCI response function. (left figure).
The resulting 21 match-up (May-October 2016, 11 wavelengths) are shown on the two plots on the right.

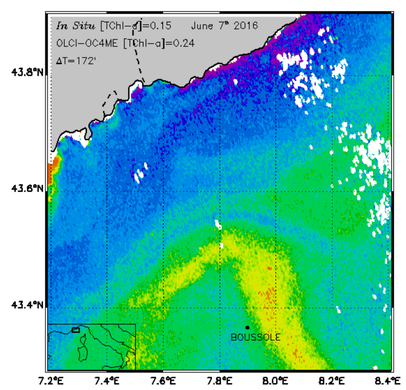




SHIP







Discrete water samples were collected during BOUSSOLE monthly cruises close to the mooring. [TChl-a] was measured through HPLC analyses.
Two OLCI images were available with concurrent [TChl-a] data and shown on the figures on the left along with *in situ* and satellite match-up values. Note that the OC4Me global algorithm is used for OLCI which is known to overestimate [TChl] in the Mediterranean Sea at low concentrations.

DOWNLOAD

ACKNOWLEDGEMENTS

Disclaimer

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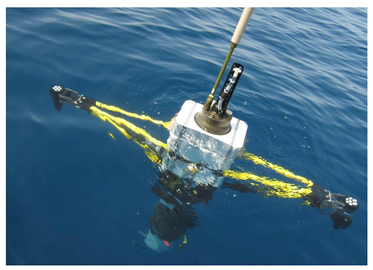
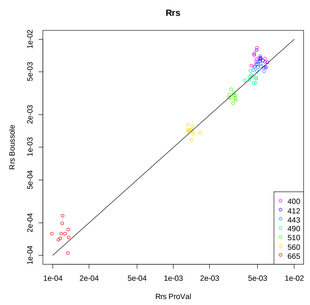
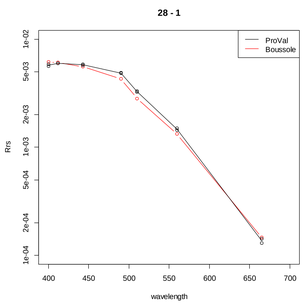
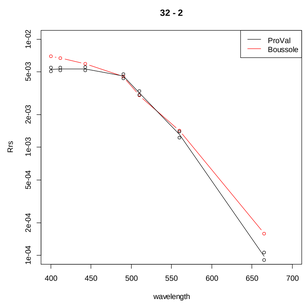
FLOAT



The ProVal (left picture) is a new float (based on PROVOR CTS5, NKE) equipped with 2 Satlantic OCR-500 combos (Ed+Lu at 7 λ: 400, 412, 443, 490, 510, 560, 665 nm).
No deployment was possible in the S3A commissioning phase. Here we show a comparison from test deployments close to BOUSSOLE.







Comparison between BOUSSOLE and ProVal is encouraging with possible amelioration for ProVal data processing.
Series of deployments and recoveries of ProVal close to BOUSSOLE will start this year, improving robustness and spatial coverage of cal/val match-up.

CONCLUSION

First results of OLCI evaluation at the end of the commissioning phase over the BOUSSOLE area are promising.
Improved performances are expected after the System Vicarious Calibration will be accomplished.