

COLOR: CDOM-proxy retrieval from aeOLus ObseRvations

**D. Dionisi⁽¹⁾, S. Bucci², C. Cesarini¹, S. Colella¹, D.
D'Alimonte³, L. Di Ciolo², P. Di Girolamo⁴, M. Di
Paolantonio¹, N. Franco⁴, G. Gostinicchi², T. Kajiyama³, G. L.
Liberti¹, E. Organelli¹, R. Santoleri¹**

⁽¹⁾ *Institute of Marine Sciences, Italian National Research Council, Rome, Italy, Davide.Dionisi@cnr.it*

⁽²⁾ *) Serco Italia S.p.A., Frascati, Italy Affiliation, Short address (including country), E-mail:*

⁽³⁾ *AEQUORA, Lisbon, Portugal Affiliation, Short address (including country), E-mail:*

⁽⁴⁾ *School of Engineering, University of Basilicata, Potenza, Italy E-mail:*

During the last decade, new applications exploiting data from satellite borne lidar measurements demonstrated that these sensors can give valuable information about ocean optical properties. Within this framework, COLOR (CDOM-proxy retrieval from aeOLus ObseRvations) is an on-going (KO: 10/3/2021) 18 month feasibility study approved by ESA within the Aeolus+ Innovation program. COLOR objective is to evaluate and document the feasibility of deriving an in-water AEOLUS prototype product from the analysis of the ocean sub-surface backscattered component of the 355 nm signal. In particular, COLOR project focuses on the AEOLUS potential retrieval of: 1) Diffuse attenuation coefficient for downwelling irradiance, (K_d [m^{-1}]); 2) Sub-surface hemispheric particulate backscatter coefficient (b_{bp} [m^{-1}]).

The core activity of the project is the characterization of the signal from the AEOLUS ground bin. In principle, the ground bin backscattered radiation signal is generated by the interaction of the emitted laser pulse radiation with two media (atmosphere and ocean) and their interface.

To characterize this ground bin, two parallel and strongly interacting activities were developed:

- a) Radiative transfer numerical modelling. This tool will be essential to simulate the relevant radiative processes expected to be responsible for the generation of AEOLUS surface bin signal.
- b) AEOLUS data analysis. The objective of this activity will be to verify the information content of the AEOLUS ground bin signals and the assumptions for data product retrieval.

The preliminary results about the above-mentioned activities will be here presented. In particular, the sea-surface backscattering and the in-water contribution of the AEOLUS ground bin have been estimated through numerical modeling. Furthermore, the preliminary experimental data analysis suggests that the observed excess of signal in the AEOLUS ground bin could be related to the signal coming from the marine layers. Analyses are planned in the second phase of these activities to disentangle atmospheric and oceanic signal contribution in the AEOLUS ground bin.