Wednesday, October 10
Poster Session 3
16:00–18:00

Poster 11

AN INVESTIGATION OF THE SUBSURFACE CHLOROPHYLL MAXIMUM DYNAMICS IN THE MEDITERRANEAN SEA FROM A BIOGEOCHEMICAL-ARGO FLOAT DATABASE

As commonly observed in oligotrophic stratified waters, a Subsurface (or Deep) Chlorophyll Maximum (SCM) frequently characterizes the vertical distribution of phytoplankton chlorophyll in the Mediterranean Sea. Occurring far from the surface layer "seen" by ocean color satellites, SCMs are difficult to observe with adequate spatio-temporal resolution and their biogeochemical impact remains unknown. BGC-Argo profiling floats represent appropriate tools for studying SCMs dynamics. Based on data collected from 36 BGC-Argo floats deployed in the Mediterranean Sea, our study aims to address two main questions: (1) Do SCMs result from a carbon biomass increase or from physiological acclimation? (2) Which environmental factors control their occurrence and dynamics? First, we analyzed the seasonal and regional variations of the chlorophyll concentration (Chla), particulate backscattering coefficient (bbp), a proxy of the Particulate Organic Carbon (POC), and environmental parameters (PAR and nitrates) within the SCM layer over the Mediterranean basin. The vertical profiles of Chla and bbp were then statistically classified, and the seasonal occurrence of each of the different types of SCMs quantified. Finally, a case study was performed on two contrasted regions and the environmental conditions at depth were further investigated to understand which parameter controls the SCMs. In the Eastern Basin, SCMs result, at a first order, from photoacclimation process. Conversely, SCMs in the Western Basin reflect a biomass increase at depth benefiting from both light and nitrates resources. Our results also suggest that a variety of intermediate types of SCMs are encountered between these two end-member situations.

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