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# *Interactive comment on* "Bio-optical characterization of subsurface chlorophyll maxima in the Mediterranean Sea from a Biogeochemical-Argo float database" *by* Marie Barbieux et al.

**Anonymous Referee #2**

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General Comment: The authors in this paper use number of Bio-Argo floats data to understand the distribution of Deep Chlorophyll maxima and its controlling environmental factors. The observation of biogeochemical parameters using modern autonomous floats is the need of the hour and they provide some critical information of BGC processes at higher spatial and temporal scale and the authors make use of a large data set from the Mediterranean basin. The technique and data used for this study is novel, interpretation of the data etc and the write up are all well organised and coherent. The authors have explained the quality control adequately that helps readers and other



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Discussion paper

researchers to plan for a similar observation and quality control of the data for other basins. I am aware of the fact is international BGC community is pushing hard to implement BIO-Argo on the scales of core Argo and this paper rightly justifies the need. The presence of deep chlorophyll maxima has been found and reported for many basins and authors have adequately cited their work. The new approach, however, is to use the slope or gradient to better understand the mechanism is an added advantage for this manuscript. I strongly recommend this manuscript for publication in Biogeosciences. Having said this, I have a few concerns which I thinks author should address. For example, though the authors have tried to explain the environmental factors that cause the presence of deep chlorophyll maxima, they have not explained the physical factors and their role. Much of their emphasis has been to relate the observations with parameters such as Par, Nitracline etc. I would like to include some description on the physical condition and variability in the MLD, thermocline etc. These factors also play a dominant role, particularly in defining the depth of nitracline or other nutrients distribution. The schematic explanation in figure 12 should also include the location (depth) of mixed layer and thermocline. I am not aware of the relation between thermocline and nitracline in Mediterranean sea but in tropical basins such as the Arabian sea, they are strongly coupled and one need to understand the variability in thermocline to understand the shape and depth of nitracline. The manuscript is well written; objectives and methods are well explained. Overall the manuscript reads well and is relatively easier to understand compared to the manuscript I usually receive for review.

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