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Comment

## ***Interactive comment on* “On the vertical distribution of the chlorophyll *a* concentration in the Mediterranean Sea: a basin scale and seasonal approach” by H. Lavigne et al.**

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**General Comments** This manuscript presents the results of a descriptive analysis conducted on a large dataset of chlorophyll-*a* (chl<sub>a</sub>) profiles collected in the Mediterranean Sea between 1994 and 2014. The main objective of the work is to improve our knowledge of the spatio-temporal variability of the vertical distribution of chl<sub>a</sub> in this region. After applying a series of existing methods to convert fluorescence into chl and to quality control the data, the authors present a new methodology to characterize the shapes of chl<sub>a</sub> profiles and further proceed with describing their climatological spatio-temporal characteristics in the Med Sea. The results confirm and expand upon

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previous findings obtained mostly from satellite data by providing new quantitative and qualitative information on the seasonal variability of the vertical distribution of chl<sub>a</sub>. Quantitative data are presented as monthly climatologies of chl<sub>a</sub> in four key locations and as seasonal transects along the 5°W meridian. In addition, a qualitative description of the temporal variations of the shape of the chl<sub>a</sub> profile is presented for different eco-regions. The authors then investigate the spatio-temporal variations of the depth of the deep chl<sub>a</sub> maximum (DCM) and finally compare their dataset to an existing climatology and to parametrizations derived for the global ocean.

The authors conclude that the vertical distribution of chl<sub>a</sub> in the Med Sea is generally characterized by the presence of a DCM. However, a large amount of spatial and temporal variability further affects the qualitative and quantitative characteristics of the chl<sub>a</sub> profile.

Overall, I believe the results presented in this manuscript are significant and should be published pending minor revisions.

I would recommend addressing the following main points:

- I would have a native English speaker proofread the manuscript, as I found several typos (for some of them I added corrections).
- The manuscript would be stronger if you could provide (in section 1.2) a better justification as to why it is important to understand the dynamics of the vertical distribution of chl<sub>a</sub>.
- The analysis is based on fluorescence data corrected for non-photochemical quenching (NPQ) using a previously published method, which is based on extrapolating the maximum fluorescence value in the mixed layer to the surface. I would expect this method to be insufficient to correct for NPQ in most of the Mediterranean Sea, where relatively shallow mixed layers and clear waters would allow

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NPQ to affect fluorescence profiles much deeper than the mixed layer. I think it would be important to address and discuss this issue.

- I would restructure the Conclusion section so that it summarizes the most important findings. As it stands now, it seems like a continuation of the Discussion.

I have also added several minor comments to the original text: see attached pdf file.

Please also note the supplement to this comment:

<http://www.biogeosciences-discuss.net/12/C1025/2015/bgd-12-C1025-2015-supplement.pdf>

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