

## ***Interactive comment on “Deep maxima of phytoplankton biomass, primary production and bacterial production in the Mediterranean Sea during late spring” by Emilio Marañón et al.***

### **Anonymous Referee #1**

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This is an interesting paper in which the authors discuss the role of photoacclimation and enhanced growth as the underlying mechanism of the DCM in the Mediterranean Sea during the late spring. The study was carried out from 10 May to 11 June during the PEACETIME cruise.

The study is exciting; however, I have the following comments/suggestions which will make this manuscript publishable after authors incorporate and modify the paper.

How can you be sure that the dominance of diatoms at the DCM was resulted from cell sinking from the upper layers due to photoacclimation rather than the new production?

I suggest the authors to check any physical mechanism like the role of Rossby wave

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etc. Analysis of the physical processes in the region is compulsory when you discuss the DCM properties and the underlying mechanism.

At stations TYRR and FAST, DCM was deeper than nitracline depth. However, DCM was located above the nitracline depth at ION. From this, I understand that the physical processes operating at ION may be different from the other two stations. Hence, insisting to look into the water column stability in all the three stations during the measurement period.

In all the three stations, DCM was just below the 1% PAR depth and below the nitracline depth except the station ION; where nitracline depth was deeper than DCM. Have you noticed any difference in phytoplankton characteristics in the DCM at ION compared to the other two? I feel you can make out the difference from the size of the phytoplankton cell. Please check it and confirm that your hypothesis is true in all the three stations.

It is also not clear how the individual role of photoacclimation and biomass contribution was explored? Please mention the way to quantify it?

I feel that the manuscript needs major revision by addressing the above comments.

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