

Biogeosciences Discuss., referee comment RC1
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Comment on bg-2020-473

Emmanuel Boss (Referee)

Referee comment on "Radiative transfer modeling with BGC-Argo float data in the Mediterranean Sea" by Elena Terzić et al., Biogeosciences Discuss.,
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Review of: 'Radiative transfer modeling with BGC-Argo float data in the Mediterranean Sea' by Terzic et al.

Reviewer: Emmanuel Boss

This paper studies the utility using simple radiative transfer (RT) model + input from BGC-Argo floats to obtain reasonable optical properties in the water column. A variety of different models are used and evaluated using radiometry and remote sensing measurements.

The topic of the paper is novel and of interest to the biogeosciences readership. I think that with appropriate revisions it could be a useful contribution.

I have major comments that I detail here and more minor one that are on the PDF I am sending back.

- The paper needs some more editing to be easily readable.
- Its organization could be improved a lot using tables describing the different configuration used (e.g. Which specific IOP choice for each, which property profile is used for each) and to display the results.
- The neglect of Raman needs significant justification, in particular at 490nm where it could significantly affect measured K_d and R_{rs} .
- The neglect of a_{ϕ} at 380nm deserves more justification. Works of Bricaud, among others, suggest significant phytoplankton absorption there due to MAAs, particularly near the surface.
- The effect of S and T on water IOPs is very different in the bands investigated. S primarily contribute to backscattering but if a mean salinity is used, the change may be rather small. T affects primarily absorption in the NIR. Again, using an average T may be more than sufficient anywhere else.
- The final result that the best choice is $bbp_{\tilde{}} = 0.002$ and $\eta = 0$ deserves attention. It does not seem consistent with expectation from other studies.
- It is not clear why there seem to be no configuration with F_{chl} providing the vertical profile for a_{ϕ} , F_{dom} for a_{cdom} and b_{bp} for b_{bp} and NAP. If this one does not work well, please explain why you think it does not? What are the implications?

Dear authors: I am often wrong. If you feel my comments are 'off mark' please contact me and if convinced I will be happy to change them.

Please also note the supplement to this comment:

<https://bg.copernicus.org/preprints/bg-2020-473/bg-2020-473-RC1-supplement.pdf>