

Biogeosciences Discuss., referee comment RC2  
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## Comment on bg-2021-283

Ahmad Fehmi Dilmahamod (Referee)

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Referee comment on "The impact of the South-East Madagascar Bloom on the oceanic CO<sub>2</sub> sink" by Nicolas Metzler et al., Biogeosciences Discuss.,  
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This study makes use of in-situ data from the OISO Project, among others, to understand the impact of the South-East Madagascar Bloom on the oceanic carbon sink. This is a first attempt to investigate how this large sporadic austral summer bloom can potentially contribute to the oceanic carbon sink. The physical drivers of this bloom have long been investigated with various possible mechanisms, although it seems to be coming down to a combination of a few factors which can contribute to the initiation of the bloom. On this note, the question of its impact on the oceanic carbon sink were previously raised but the lack of in-situ data hinders any research.

This very interesting study is well-structured and well-written. And with the right data, it provides new insights on the biogeochemical signature of this bloom. It clearly shows the difference between fCO<sub>2</sub> during a bloom and non-bloom (or low bloom) year, and that this difference is due to biological processes during the boom. And that it acts as a CO<sub>2</sub> sink (between -1.7 and -2.7 TgC/month).

Having said that, I am slightly less impressed with the reconstructed fCO<sub>2</sub> and air-sea CO<sub>2</sub> fluxes from Chau et al. (2021), which is still in review. I would expect that the Chau et al. (2021) is accepted before the current manuscript. I am also a bit puzzled because from Figures 11, S10 and S11, it seems that the impacts of the previous bloom years (1999, 2000, 2004, 2006, 2008, 2012-14) on the reconstructed fCO<sub>2</sub> and air-sea CO<sub>2</sub> flux are almost non-existent, whereas a significant drawdown is found for the 2020 one. I think that this variability from the CMEMS-LSCE-FFNNN is interesting, and deserve to be included and possibly explained in the text.

However, these do not take away the importance of in-situ data in this data-limited region and I am sure that the few comments can be easily addressed by the authors and that might help to improve this already good paper. Thus, I recommend this paper for publication, once the comments have been addressed, and the Chau et al. (2021) paper accepted.

**Minor Comment:**

On lines 318-319, the authors mentioned the presence of a clear signal of the SEMC retroflection. A recent paper by Ramanantsoa et al. (2021) discussed the early-retroflection, retroflection and no retroflection of the SEMC, and the impacts of the early-retroflection on the SEMB. I recommend including this citation in the discussion.