

Ocean Sci. Discuss., referee comment RC2
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Comment on os-2021-44

Anonymous Referee #2

Referee comment on "Control of oceanic circulation on sediment distribution in the southwestern Atlantic margin (23 to 55°S)" by Michel Michaelovitch de Mahiques et al., Ocean Sci. Discuss., <https://doi.org/10.5194/os-2021-44-RC2>, 2021

Mahiques et al. in the manuscript entitled "New insights of the influence of ocean circulation on the sedimentary distribution in the Southwestern Atlantic margin (23oS to 55oS) based on Nd and Pb isotopic fingerprinting" used radiogenic Pb and Nd isotopes to trace the provenance of the sediments in the Southwestern Atlantic margin. In this study, they report detrital Pb and Nd isotopic to reconstruct circulation and sedimentary provenance changes as a foundation of their conclusion. However, the manuscript is written carelessly. Starting from Line 205, almost all superscripts of Pb and Nd isotopes are missing. These mistakes give me a very hard time following the manuscript. I think this manuscript needs major revision and perhaps additional data before this can be deemed suitable for publication.

Since I have already seen the comments from Reviewer 1, I will skip the duplicated comments here. First of all, I strongly recommend the authors to show the legends in all Figures. The authors use different marks to represent the data from different areas. In figure 1, there is a legend inside which is good, but in Figure 3 the legend is gone while there still notes in the caption. What's worse happened in figure 7, I can't even find anything in the caption. I really get lost there.

I have a suggestion which the author can decide to do or not. It is a very long text in section 2 as Morphology, Sedimentary cover, and Ocean Circulation parts. It is good to introduce the basic background and previous work, but I find not all of those parts are very related to this work. My feeling is there is no very clear focus but just simple descriptions. I suggest the author remove some unrelated parts and move some parts to the discussion section.

I also have questions about the methods. In Line 198, the authors state that "Sediment powder (70 mg) was dissolved with HF, HNO₃, and HCl acids." However, in Line 211 It then said that "The Nd analyses, here reported as ϵ_{Nd} , were prepared by standard

methods by the analytical procedures described by Sato et al. (1995) and Magdaleno et al. (2017), involving the removal of calcium carbonate, HF-HNO₃ dissolution plus HCl cation exchange using a Teflon Powder column to separate REE." These are contradicting each other. Did the author remove the calcium carbonate or not? In addition, there a lot of papers reporting reformed Fe-Mn oxides in the sediments near the continent which could be a strong interference to the detrital signals. Did the authors also remove the Fe-Mn oxide coating in their sediment samples? I haven't seen this step in their method. Besides the chemistry, the authors give the NBS-981 and JNdi results as standard. However, these two standards are used as internal standards to normalize the fractionations. Is there also an external standard to show the analytical reproducibility?

Minors:

I fully agree with the comments from Reviewer 1 about the expression in this manuscript, i.e. "there are a number of problems with the language expression and data interpretation, which will require major revision or complete rewriting of the manuscript". There are some examples that I still need to point out.

Line 19, "Pb and Nd radiogenic isotopes" should be "radiogenic Pb and Nd isotopes".

Line 33, "Long half-life radiogenic elements, such as Sr, Pb, and Nd" is not a proper description. Not all isotopes of Pb, Nd, and Sr are radiogenic, so you cannot say these elements are radiogenic. Besides that, the long half-life should refer to their radioactive parents, but the daughters.