

To the Editor of Ocean Science

Ref. 2nd review of the manuscript

“New insights of the influence of ocean circulation on the sedimentary distribution in the Southwestern Atlantic margin (23°S to 55°S) based on Nd and Pb isotope fingerprinting”

Dear Sirs,

We acknowledge Reviewer 2 for his/her evaluation and comments about our manuscript. As for Reviewer 1, we will comment on each of the points presented by the Reviewer. In a few weeks, we expect to provide a revised version of the manuscript (with track changes) indicating all of the changes.

1. However, the manuscript is written carelessly.

ANSWER: a full revised manuscript will be provided soon

2. Starting from Line 205, almost all superscripts of Pb and Nd isotopes are missing.

ANSWER: The superscripts were all present in the MS-Word file (.docx). For the reason that we do not know, they were all formatted as “hidden,” and we did not notice it until Reviewer 1 complained.

3. 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.

ANSWER: We acknowledge the comment. These mistakes will be corrected in the next version. Concerning Figure 7, we will remove it since it is causing much confusion

4. 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.

ANSWER: We acknowledge the Reviewer. We will try to reduce this topic to the necessary.

5. 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?

ANSWER: We acknowledge the Reviewer. All of the samples were decarbonated (with HCL) before dissolution. We will include this information in the new version

6. 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.

We did not remove the Fe-Mn coating. The main reason is that as far as we know from all of the previous papers in the area, none of them made the removal of Fe-Mn coating. The absence of leaching extends to all of the papers on potential sources that we used. Then, to compare our data with the previous ones, we decided not to remove it. Also, most of the coating is present in carbonates (foraminifera, for example). Considering that our analyses were made on carbonate-free samples, we understand that this interference might be reduced, despite not totally eliminated.

7. 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?

ANSWER: Indeed, the reproducibility analysis was made, using Buffalo River Sediment (NIST-RM8704) (n = 7), with the following results:

$$^{143}\text{Nd}/^{144}\text{Nd} = 0.51203 \pm 0.00001 \text{ (SD)}$$

$$^{206}\text{Pb}/^{204}\text{Pb} = 18.846 \pm 0.018 \text{ (SD)}$$

$$^{207}\text{Pb}/^{204}\text{Pb} = 15.646 \pm 0.005 \text{ (SD)}$$

$$^{208}\text{Pb}/^{204}\text{Pb} = 38.503 \pm 0.016 \text{ (SD)}$$

We added this information to the new version

8. Line 19, “Pb and Nd radiogenic isotopes” should be “radiogenic Pb and Nd isotopes”.

ANSWER: Corrected in the new version

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.

ANSWER: Corrected in the new version

Once more, we acknowledge both Reviewers for their comments. We hope to provide a fully revised version in few weeks.

Sincerely

Michel M de Mahiques

On behalf of the authors