

To the Editor of Ocean Science

Ref. 3rd 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 3 for his/her evaluation and comments about our manuscript. We hope to provide a revised version of the manuscript (with track changes) in a few weeks indicating all of the changes.

1. Broadly, the discussion is poorly written, difficult to follow and possibly need a rewrite.

Answer: We hope to provide a better version shortly

2. The details of study area is just mere description which is not related to this study.

Answer: We acknowledge the comment. Part of the text was removed.

3. Most of the statistical result are not well linked with discussion.

Answer: We acknowledge and will provide a better version

4. Thus, I recommend for a major revision of present version.

Answer: We are working on a fully revised version

5. Authors have claimed “new insight” which they have to specifically highlight in the Abstract. I feel, this is an incremental work based on previous publication by Mahiques et al., 2008, Marine Geology which had no epsilon Nd. It must be highlighted in the paper main text as well.

Answer: We are making changes along with the whole manuscript

6. Introduction need to be more incisive and a proper hypothesis need to be defined. Why there is a need for radiogenic isotope data which will provide a better understanding of the provenance of sediments in the SAM?

Answer: We will provide a better explanation in the reviewed version

7. Study area description can be trimmed down.

Answer: Please check the answer to topic 2, above

8. I could not see a need for Fig. 2, 3, and 4. How these result helps in assessing the role of ocean circulation on sediment transport? This is completely missing in the discussion.

Answer: We respectfully disagree. One of the manuscript topics is the utilization of the concept of sediment fingerprinting (Walling, 2013; Miller et al., 2015; Palazon and Navas, 2017). This concept first involves verifying which variables can be used as fingerprints, demanding a univariate analysis (such as a Mann-Whitney Analysis). Then, it is necessary to numerically relate the sectors to variables from the fingerprints, which is made with multivariate analysis (such as a Discriminant Analysis). In this sense, Figure 2 shows a graphic in which it is possible to recognize the variables that present statistically significant differences (all but  $^{206}\text{Pb}/^{204}\text{Pb}$ ); Figure 3 shows the latitudinal trends of the different variables, and Figure 4 is the graphical expression of the Discriminant Analysis. In this sense, we understand that there is no way to explain the results of the Fingerprinting by removing these figures.

9. I have no clue why authors have not put isotopic ratios with corresponding isotopes e.g.  $^{206}\text{Pb}/^{204}\text{Pb}$ ,  $^{207}\text{Pb}/^{204}\text{Pb}$  and so on. The same is missing in material and methods.

Answer: As explained previously to the other reviewers, for the reason that we do not know, most of the superscripts were formatted as “hidden” in the MS-Word template. Then, when exporting to pdf, these numbers disappeared. We only noticed this when Reviewer 1 complained about it.

10. Rest of my comments are similar to those raised by other 2 reviewers and suggest authors to consider it carefully, particularly those raised by Rev #1.

Answer: We hope to provide a better version in a couple of weeks

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

References cited above

Miller, J. R., Mackin, G., and Orbock Miller, S. M.: Geochemical Fingerprinting, in: Application of Geochemical Tracers to Fluvial Sediment, edited by: Miller, J. R., Mackin, G., and Miller, S. M. O., SpringerBriefs in Earth Sciences, Springer, Cham, 11-51, 2015.

Palazon, L., and Navas, A.: Variability in source sediment contributions by applying different statistic test for a Pyrenean catchment, J Environ Manage, 194, 42-53, 10.1016/j.jenvman.2016.07.058, 2017.

Walling, D. E.: The evolution of sediment source fingerprinting investigations in fluvial systems, Journal of Soils and Sediments, 13, 1658-1675, 10.1007/s11368-013-0767-2, 2013.