# Author's Response to the Review Comments

***Journal:*** Climate of the Past

***Manuscript #:*** EGUSPHERE-2025-3832

***Title of Paper:*** Decoding the North Atlantic Ocean Circulation Breakthrough in the Aptian–Albian Transition

***Authors:*** João M. F. Ramos, Jairo F. Savian, Daniel R. Franco, Milene F. Figueiredo, Rodolfo Coccioni, and Fabrizio Frontalini.

***Date Sent:*** Jan 21, 2026

Dear Editor Shiling Yang,

We appreciate the time and efforts by the Editor and Reviewers in reviewing this manuscript. We have addressed all issues indicated in the review report and believe that the revised version can meet the journal publication requirements. We have also complemented the paper with additional information as suggested by the Reviewer.

Yours sincerely,

João M. F. Ramos

# Response to Comments from Editor

## Comment 1:

*Dear João Ramos,*

*Thank you for submitting your manuscript, titled "Decoding the North Atlantic Ocean Circulation Breakthrough in the Aptian–Albian Transition), to Climate of the Past. We have now received evaluations from two of the three invited reviewers, and I have assessed your work based on their feedback and my own reading.*

*The reviewers' comments are generally positive. One reviewer has recommended acceptance, and the other has suggested minor revisions. The third reviewer's report has not been received within the expected timeframe, and as the handling editor, I have decided to proceed with the decision based on the two reports in hand. Therefore, I am pleased to inform you that our decision is "Minor Revisions."*

*We appreciate your contribution to Climate of the Past and look forward to receiving your revised manuscript. Should you have any questions, please do not hesitate to contact me.*

*Best regards,*

*Shiling Yang.*

## Response:

We greatly appreciate the Editor efforts to carefully review the paper and the valuable suggestions offered. Thank you for the opportunity to make minor revisions and necessary changes. We agree with Editor and Reviewer's comments and recommendations, as you will see in the following replies point-by-point.

# Response to Comments from Reviewer #3 (Helmut Weissert)

## Overall Comment:

*The authors have submitted a substantially revised manuscript, and their responses to my comments are accurate. However, there remain a few parts in the text that I believe could be further improved:*

## Response:

Thank you for re-evaluating our manuscript and for highlighting these important points. Below, we provide detailed responses to the reviewer's comments and observations. We hope that these revisions adequately address the concerns raised and that the manuscript now meets the standards of *Climate of the Past*.

## Comment 1:

*"Geological setting"*

*-Lines 104-108 the authors repeat the description of the Cretaceous sediments: "The Cretaceous sediments …. " and later "The sediments are clayey… Please shorten and merge descriptions.*

## Response:

Thank you for pointing out this issue. We have revised the paragraph accordingly, which now reads as follows:

"*The Cretaceous sediments at this site consist mainly of nannofossil chalk and claystone, including clayey and organic-rich intervals, with red, white, green, and black beds (Norris et al., 1998). Abundant planktonic and benthic foraminifera with well-preserved glassy tests indicate minimal diagenetic alteration (Erbacher et al., 2001; Li et al., 2011).*" (Lines 104 – 106 of the revised manuscript).

## Comment 2:

*-Line 115 clay assemblage points at "dry, cold climate with low rainfall" > dry climate has low rainfall, I assume, and what is the evidence for cold climate?*

## Response:

Indeed, it is not appropriate to infer cold climatic conditions based solely on the data from ODP Site 1049. We have therefore removed the reference to climate from this paragraph and now focus exclusively on oxic bottom-water conditions, as supported by the presence of a benthic community. Thank you for drawing our attention to this point. The revised text now reads as follows:

" *At ODP Site 1049, the formation of iron oxides under oxic bottom-water conditions is supported by the presence of a flourishing benthic community (Wang et al., 2009; Norris et al., 1998; Kochhann et al., 2023).*" (Lines 113 – 115 of the revised manuscript).

**Comment 3:**

*-Line 124: the "c -marks" ? C-isotope segments ? C-isotope excursions/events? please improve*

**Response:**

Done. We have added clarifying text to the revised manuscript to better characterize what the C-marks represent: "These C-marks (prominent features of the stable $\delta^{13}C$ curve, including excursions, peaks, troughs, and shifts in the long-term behavior of the carbon isotope records, as described in Ramos et al., 2024a)." (Lines 122 – 123 of the revised manuscript).

**Comment 4:**

*-3.1. Magnetostratigraphy*

*This chapter is not really a method chapter, the authors reinterpret an available magnetostratigraphy > needs to be shifted to discussion. (p 20, where they also discuss magnetostratigraphy).*

**Response:**

Done. Thank you for the suggestion. We have merged these two sections in the Discussion (lines 407–464 of the revised manuscript).

**Comment 5:**

*-Result chapter*

*307-314 also this part can be shifted from the result chapter to the discussion*

**Response:**

We agree with the reviewer's suggestion and have moved this paragraph to the Discussion section (lines 347–354 of the revised manuscript).

**Comment 6:**

*-Discussion*

*I am irritated that the authors do not begin their discussion by connecting their new data with already existing data. Chapter 5.1 is a general review chapter and only in 5.2. the new data are discussed within a palaeoceanographic framework. Why not shift the big synthesis into the last part of the discussion and start with what is new.*

**Response:**

Ok. Thank you for the suggestion. Done.

**Comment 7:**

*-340 the authors may add a sentence or two explaining the link between cooling and LIP emplacement (they give an explanation in their conclusions, line 564).*

**Response:**

We agree with the reviewer that this paragraph lacked a clearer explanation of the link between cooling and LIP emplacement. Following this suggestion, we have added more specific contextual information to the revised manuscript (lines 475–481), where we now state:

"*Large Igneous Province (LIP) emplacement during the Early Cretaceous, particularly the development of the Kerguelen Plateau, is widely regarded as a major driver of carbon-cycle perturbations and climatic variability (Coffin and Eldholm, 1994; Percival et al., 2024). Extensive volcanic degassing initially promoted greenhouse conditions and widespread oceanic anoxia during the early Aptian (Weissert and Lini, 1991; Jenkyns, 2003). In contrast, enhanced silicate weathering of newly emplaced basalts and increased organic carbon burial likely led to a drawdown of atmospheric $CO_2$, facilitating episodic to transient cooling during the late Aptian (Weissert et al., 1998; Jenkyns et al., 2012).*"

**Comment 8**

*-"Global or regional"*

*410 and 450: synchroneity is observed between western Tethyan and Atlantic data; however, anoxia does not yet appear to be global, it is currently a Central Atlantic–western Tethys feature (global are C-isotope anomalies).*

**Response:**

We agree with this point. At present, there are insufficient data to support a global interpretation. We have therefore removed the term "global" and replaced it with "regional" (lines 321–323 and 371 of the revised manuscript). We thank the reviewer for pointing this out.

**Comment 9**

*-5.6. >I recommend to merge this chapter with method chapter on magnetostratigraphy. - And some minor inconsistencies:*

**Response:**

Done. See comment 4 (lines 407–464 of the revised manuscript).

**Comment 10**

*Line 488 M0 chron: 120,29-19.70 Ma*
*492 base of chron is 120.20 Ma, please clarify or cite all the assigned ages*

**Response:**

We have revised this part of the manuscript to incorporate the most recent age constraints for the M0r Chron (Ramos et al., 2026), combining the radioisotopic data of Li et al. (2023) with the astrochronological results of Leandro et al. (2022). At the time of the initial submission, this article had not yet been accepted; however, given its subsequent publication, it is now appropriate to use these updated age estimates.

**Comment 11**

*490 ...proposed marker for the Barremian-Aptian boundary, please cite original GSSP proposal by Erba et al. 1996. The Cretaceous Subcommission rejected this proposal, yet, the base of M0 has been used informally as base of the Aptian until today (However, a new GSSP proposal is in preparation with R. Coccioni as a member of the working group).*

**Response:**

Done. We have added this reference to the revised manuscript. Thank you for your thorough and insightful review, as well as for highlighting key references that were instrumental in strengthening the manuscript and improving its suitability for publication in *Climate of the Past*.