

We would like to thank the Anonymous Referee #2 for the valuable comments as well the editor for the time considering this manuscript. Below we provide a response to the comments.

Anonymous Referee #2

I have read with great interest the paper of Guitián et al. on the “Variation in calcification of *Reticulofenestra* coccolith over the Oligocene-Early Miocene”. The article presents new data, and the authors might be right in stating that this is one of the first papers of its kind in the studied region. The article merits publication in *Biogeosciences*. And I would suggest some minor corrections.

Specifically, I have the following comments:

General about *Reticulofenestrids*,

In the Early Miocene, the assemblages of Noelaerhabdaceae include many *Cyclicargolithus floridanus*, which are circular shapes. Therefore, I suggest that this specimen (or group) is separated from *Reticulofenestra* group.

The reviewer suggests that the assemblage composition of the Noelaerhabdaceae should differentiate the *C. floridanus* group from the *Reticulofenestra* group given its different morphology. However, the difference in shape (circular or elliptical) does not affect the calculation of calcification or shape factor in this study, because unlike previous studies which use a shape factor only based on length (e.g Young and Ziveri, 2000), here we use both the length and width, effectively accounting for changes in the circularity. We consider that for an appropriate environmental survey of the Noelaerhabdaceae family and the scope of this study (evaluate changes in cellular calcification of main coccolithophores from the Oligocene-Miocene time interval); all groups from the *Reticulofenestra* genus (i.e *R. bisecta*, *R. lockeri*, *R. umbilicus*, *C. floridanus*, etc) should be taken into account. Importantly, the high calcifying *C. floridanus* group should be included given its important contribution to the carbonate fraction. This is now clarified within lines 52 to 54 and through the text.

Chapter 2

Line 88; How do you estimate the thickness and volume between proximal and distal shields? Please add the details of the analysis method of thickness under the microscope.

Chapter 4

Line 180; It seems that these thicknesses indicate only distal shield size. The reticulofenestrids are placolith groups. How do you analyze the thickness between distal and proximal shields?

We thank the reviewer for prompting us to further clarify components quantified in the thickness calculation. The measured thickness corresponds indeed to the total accumulated calcite through the crystal (i.e. proximal shield + distal shield). Using circular polarization, all the birefringent materials (r-units) (Young et al., 2004) are seen and present no extinction at any orientation. Thus, the components of the coccoliths formed by r-units (shields, tubing, etc.) are seen with a light intensity and colour that are determined by the thickness of the calcite. Now we clarify this in the text lines 87-90 and to avoid misunderstanding also at figures 2 and 3 footnotes.

Table 1; Please adjust the width size of each cells (e.g. centralizing etc.).

Table has been adjusted and will be presented in the supplement as table S1 following referee 2 comments.

Table 2; Please adjust the width size of each cells (e.g. centralizing etc.).

Table has been modified into new figure 6 where we show all correlation coefficients in a clarified format

References

- Young, J. R. and Ziveri, P.: Calculation of coccolith volume and its use in calibration of carbonate flux estimates, *Deep sea research Part II: Topical studies in oceanography*, 47, 1679-1700, 2000
- Young, J. R., Henriksen, K. & Probert, I. (2004). Structure and morphogenesis of the coccoliths of the CODENET species. In, Thierstein, H. R. & Young, J. R. (eds) *Coccolithophores - From molecular processes to global impact*. Springer, Berlin 191-216.