

Interactive comment on “Quantifying the Cenozoic marine diatom deposition history: links to the C and Si cycles” by Johan Renaudie

Anonymous Referee #1

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General considerations This paper corresponds to an updated synthesis on the Cenozoic marine diatom deposition history that compiles existing ODP and IODP data. It is an important paper with global scientific significance and quality that certainly belongs in the scope of BG. There are, however, some general and specific aspects that should be taken into account before the paper can be accepted for publication. The main problems are, in my view, the non-consideration of ODP legs that took place on the major coastal upwelling systems and that should be included in the database, such as Leg 202 on the SE Pacific or Leg175 on NW Africa. Without including these data, no clear conclusions can be reached for the history of the mid-latitude upwelling zones. Os and Sr are mentioned as weathering proxies, but there is no clear explanation as to why this is the case and that needs to be included in the introduction. The silica switch is mentioned on line 200 of pg. 6, but there is no explanation or even refer-

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ence to it. You cannot assume that all the readers know about it, so at least a short explanation and a reference is necessary. Again, on line 242 of pg. 7, you consider the Himalayan orogenesis and resulting feedback mechanisms, which together with increased diatom production were the cause for global cooling, however you do not mention those mechanisms and that needs to be specified, as well as their contribution to global cooling. From the Late Miocene to the Present, variability in the total diatom abundance, although minor than at the large events discussed in the text, does not show any correspondence to pCO₂ decreases. Shouldn't the reason for that be explained or at least hypothesized?

Specific aspects Specific aspects relate to the structure of the paper. The author has decided to separate the results from the discussion but ends up discussing also in the results section. It might be better to merge the two in a results and discussion section with subheadings to guide the reader through the text. Besides, the presentation of results and discussion should follow a chronological order, from the oldest to the younger subepochs. Also please associate ages to the considered geologic periods throughout the text. Presentation of references within the text needs to follow an order, either by alphabetic name of author, or by year of publication and this needs to be consistent throughout the text. In terms of language there is a need for revision in some parts, in order to improve the fluency of the text and provide an easier reading of the MS. Examples of paragraphs that need revision are: lines 120 and 125 in pg 4; lines 142 to 148 in pg 5; lines 182 to 189 in pg 6; lines 248 to 253 in pg 8; lines 255 to 261 in pg 8; Figure 4 – The size of the maps is so small that the paleogeographic differences between subepochs are difficult to see.

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