

Interactive comment on “Nutrient utilization and diatom productivity changes in the low-latitude SE Atlantic over the past 70 kyr: Response to Southern Ocean leakage” by Katharine Hendry et al.

Anonymous Referee #1

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General comments: Hendry et al. presented a silicon isotopic record of near-monospecific diatoms from low-latitude SE Atlantic, to explore nutrient utilization since 70 ka. Further this information, coupled with simulation results from mass-balance experiments, provides new insights into the relation of silica cycling to upwelling intensity and silicic acid utilization. In fact, an array of publications associated with the study core series (i.e., core GeoB3606 series) has been published; thereinto several publications (e.g., Shukla and Romero, 2018) have speculated the leakage of silicic acid from Southern Ocean to low- low-latitude SE Atlantic, but it is lack of compelling ev-

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idences. Here, the authors, for the first time, provide the silicon isotopic evidence to demonstrate the influences of southern-sourced silicic acid on the diatom growth in the study area. The manuscript was well written with appropriate English usages and normal logics. The conclusions are reasonably made from the presented data, and thus I approve them. I strongly recommend the publication of this manuscript after some minor modifications suggested by me as follow.

Specific comments: 1. This manuscript contains some long sentences or long sentences with brackets, such as lines 136-138, 194-196, 219-221, and so on. Although these sentences can express what the authors want to express, their readability is weak. Therefore, I suggest the authors to rewrite them; i.e., separate one sentence to more. 2. For the study core, there are enough relevant publications to provide the background on paleoenvironmental and palaeoceanographic conditions. The authors always directly cite this background information without the details. For example, the author used the SST as a proxy of upwelling intensity, but they did not explain why the SST can reflect the upwelling conditions in the study area? Not all the readers are familiar with the study area and the study core. Thus, I advise the authors to give some details when citing some important conclusive information from other publications to support their discussion. 3. To confirm the leakage of silicic acid from the Southern Ocean, the author combined the information from nutrient utilization, diatom assemblage, upwelling intensity, and so on. It is right! Other way is focus on isotopic tracing. Detailedly the author can also try to compare the silicon isotope ($\delta^{30}\text{Si}$) values among the diatoms (*A. curvatulus*+*C. radiatus*), the waters in the study area, and the southern-sourced waters, based on the silicon isotope fractionation and water mixing. I strongly recommend the authors to have a shot, but I do not guarantee its success.

Technical corrections: Line 9: It is not appropriate to state ‘...species-specific $\delta^{30}\text{Si}$...’ because the two species *A. curvatulus* and *C. radiatus* were used to analyze the $\delta^{30}\text{Si}$. Line 32: In ‘...atmospheric $p\text{CO}_2$...’, the ‘p’ should be italic. Lines 71-72: How the SST changes can account for the diatom productivity? Lines 73-75: Please explain

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this sentence with some details. Line 163: Please add '.' in the end of this sentence.
Line 170: What is the meaning of '...of what was available'? Please rewrite it. Lines
213-214: Please add the references for '...consistent with leakage of SO waters at this
time into the eastern basin of the South Atlantic'.

Interactive comment on Clim. Past Discuss., <https://doi.org/10.5194/cp-2020-115>, 2020.