

Interactive comment on “Insights into the transfer of silicon isotopes into the sediment record” by V. N. Panizzo et al.

Anonymous Referee #1

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This is the first study to present silicon isotope data for diatom opal ($\delta^{30}\text{Si}_{\text{diatom}}$) collected in lacustrine sediment traps and provides an important and novel contribution. The main objective of this study is seemingly to present the silicon isotope composition of pre-diatom bloom water samples ($\delta^{30}\text{Si}_{\text{DSI}}$ initial) collected from within the water column and sediment trap diatom opal samples that were collected in Lake Baikal. The authors have provided an important and novel data, they are of high quality, are convincing, and are suitable to be published in biogeosciences. I do have some concerns that need to be addressed and are outlined below.

My main concerns are related to the structure of the manuscript. The objectives of the study are not entirely clear and I found some detail lacking that would be important for interpretation (e.g. the definition of fractionation factor (ϵ)). Since $\delta^{30}\text{Si}$ of biogenic

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opal is still being developed as a paleo-proxy and our understanding of the governing processes is incomplete, it is important to communicate our limitations, assumptions, and definitions.

I recommend that the authors (1) clarify the purpose of their study (e.g. justification of paleo-proxy?) (2) define the terms ($\delta^{30}\text{Si}_{\text{diatom}}$, ϵ , $\epsilon_{\text{dissolution}}$, etc.) precisely, using equations so that the readers can interpret the data. (3) provide more background information on the use of $\delta^{30}\text{Si}_{\text{diatom}}$ as paleo-proxy, e.g. why is it important to develop this proxy in a freshwater environment? what are the limitations? (4) be clear about their definitions. . . For example, on page 9378, line 16 and 9380, Lines 11 and 12, the authors refer to ϵ as a diatom fractionation effect. Fractionation effect of what exactly? The language here is very confusing. (5) Provide some context for why the data are relevant for the development of the paleo-proxy and what the data can be used for in the future in their discussion/conclusion sections. What were the limitations of this study, what should we evaluate next?

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