

December 27, 2021

Dear Editor and the reviewer,

Thank all of you very much for taking the time and efforts to review our manuscript, originally titled with “APCC Data Report I: Black carbon and organic carbon dataset from atmosphere, glaciers, snow cover, precipitation, and lake sediment cores over the Tibetan Plateau and its surroundings”, that we have submitted to “Earth System Science Data” (MS No.: essd-2021-187R1). We have considered all comments and suggestions carefully, and the title has been revised as “Black carbon and organic carbon dataset over the Third Pole”. We also tried our best to address the related comments and revised the manuscript accordingly, and we hope the revised manuscript is suitable for publication in the journal.

Revisions are made to address the following specific comments.

Our point-by-point responses to the comments are listed below in blue color.

Yours sincerely,

Shichang Kang and Yulan Zhang on behalf of all co-authors

Response to comments

The referees agreed with the value of the dataset and were satisfied with the revision. After reading the manuscript, I believe that the previous comments and suggestions have been addressed. However, I still believe that minor updates can be made to further improve the manuscript:

1) I would suggest the authors give another thought on the title, which seems long, complicated, and possibly confusing, especially the expression “APCC Data Report”. The ESSD manuscript focuses on data; hence, the submissions were expected to highlight datasets. I understand that the authors were presenting/reporting the first collection of the APCC data. However, there is a risk to be misunderstood as a report instead of peer-reviewed paper, particularly a data paper. Also, I do not think that APCC is a widely used abbreviation. Use of the term, especially in the title, could be confusing and misleading readers to think it as a report from IPCC or something.

Answer: Thank you very much for the suggestion. We considered the title again base on

your comment, and we agree that the title is too long. In the original title, use the abbreviation of “APCC” may be not clear to the article. Therefore, we revised the title as: Black carbon and organic carbon dataset over the Third Pole.

2) Line 123, change “10 years” to “decade” unless it referred to exact 10 years.

Answer: Sure, we have revised accordingly.

3) Line 138, I am not sure “domain” would be a proper term for the sub regions. I would suggest reconsidering it.

Answer: The term “domain” was borrowed from the previous study by Yao et al. (2013). In their study, they indicated that “The spatial and temporal patterns of precipitation $\delta^{18}\text{O}$ and their relationships with temperature and precipitation reveal three distinct domains, respectively associated with the influence of the westerlies (northern TP), Indian monsoon (southern TP), and transition in between.” Considering it’s rarely used, we use the term as you suggested as “sub regions”.

References:

Yao T., Masson-Delmotte V., Gao J., et al., 2013. A review of climatic controls on $\delta^{18}\text{O}$ in precipitation over the Tibetan Plateau: observations and simulations. *Rev. Geophys.* Doi: 8755-1209/13/10.1002/rog.20023

4) The explanation in section 2.1 needs to be checked. It mentioned 29 stations (and sites) and then mentioned 138 sites were surveyed.

Answer: Stations in this study represent the continuous observation at this site. Usually, we setup the related instruments (e.g., TSP sampler, or Aethalometer AE33). However, “site” here is only referred to the locations we collected snow sample during our field work. There is no continuous observation performed. In order to make it clearer, we have tried to revise the explanation in the main text.

5) Section 2.2. I found that the explanation is hard to follow. I would suggest mention the

total site number at the beginning of the section, and then introduce the sites in sub regions.

Answer: Agree, we have added total site number as suggested.

6) Line 186, Chinese TP and its surroundings. The expression could be ambiguity. Did the authors mean the surrounding regions only in China?

Answer: Yes, in this sentence, we mean the station located in China. We have revised as "... continuously observed over the TP and its surroundings within China."

7) Conclusion section, I would suggest rewrite the first sentence of the first paragraph to focus on the presented dataset. It is a data description paper instead of publishing research.

Answer: The first sentence has been revised as:

The dataset of black carbon and organic carbon concentrations and their related MAC values and carbon isotope signatures from the atmosphere, glaciers, snow cover, precipitation, and lake sediments over the Third Pole region are presented.

8) The gray boundary line in figure 8 seem to be the boundary of China. I am not sure it was relevant to the figure. A similar suggestion to Figure 5 and 6, please only include country boundaries when it is relevant.

Answer: Agree, and we have revised the Figure 5, 6 and 8 as suggested.

9) Figure 11, please make sure the WSOC flux did not go off the chart. I would also suggest zoom further to the sites in the distribution map in Figure 11 to make it easier to recognize the site locations.

Answer: Agree, and we have revised.

Finally, grammar errors and ill expressions can still be found in the manuscript. For example:

10) Line 65, change "the earth's climate" to "Earth's climate" unless the authors referred to soil instead of the planet.

Answer: Revised.

11) Line 349, change “one thousand” to “1,000” or maybe “~1,000”.

Answer: Revised.

12) Line 290, change “records data” to “records”.

Answer: Revised.

13) Line 139, add “a” in front of “exact boundary”.

Answer: Revised. Thank you very much again for all the comments and suggestion to improve our manuscript. We have tried to check the whole manuscript.