



Comment on **essd-2021-195**

Anonymous Referee #2

Referee comment on "Ground-based vertical profile observations of atmospheric composition on the Tibetan Plateau (2017–2019)" by Chengzhi Xing et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-195-RC2>, 2021

This paper presents a unique dataset collected using the Multi-axis differential optical absorption spectroscopy (MAX-DOAS) at a site located on the Tibetan Plateau, where observations are extremely sparse. These vertical profile measurements of several key atmospheric compositions, i.e., AOD, NO₂, HCHO, and HONO, over a relatively long time period (Dec. 2017 ~ Mar. 2019), are very valuable to the scientific community and policy makers. Among many potential usages of the dataset, to constrain model representation and assist in satellite retrieval is the obvious imminent application. The paper is generally well-written and the collected data are readily accessible. This reviewer suggests acceptance for publication after the authors address the following minor comments.

- Under which conditions can the data be properly used?
- What is the estimated measurement uncertainty?
- The authors cross-check the data with OMI measured NO₂ and HCHO. Has any comparison with the satellite measured AOD been carried out? Since MAX-DOAS measures vertical profiles, the comparison with CALIPSO observed AOD profile will be informative and valuable.
- Addition of some metadata or readme file on the data portal will better assist potential users in correctly interpreting and using this dataset.
- Line 270, change 'HCHO' to 'HONO'.
- Line 274, change 'Such as pattern' to 'Such pattern'.