

Comment on acp-2021-892

Anonymous Referee #2

Referee comment on "In situ observation of warm atmospheric layer and the heat contribution of suspended dust over the Tarim Basin" by Chenglong Zhou et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-892-RC1>, 2021

Comment to "In-situ observation of warm atmospheric layer and the contribution of suspended dusts over the Tarim Basin"

The large amount of dust aerosols from Taklimakan Desert could introduce serious impacts on the atmospheric thermal structure by absorbing solar radiation and then change regional weather and circulation. Using in-situ radisonde observations along with the CALIPSO satellite observations, this study provides a comprehensive analysis about the warm atmospheric layer observed and examines the contribution from suspended dusts. This is particularly valuable for the aerosol science community and I would like recommend its acceptance for publication after some necessary minor revisions.

Line 32, adding "and" would be helpful before "large amounts of"

Line 52, I would suggest changing "which neighbors the Tibetan Plateau (TP) located to the south" to "with the Tibetan Plateau (TP) located to the south".

Line 62-65, A recent study also investigates the dust radiative impacts on vertical distribution of temperature and water vapor over Atlantic region, which is worthy to mention, Sun and Zhao (2020, Doi: 10.1029/2020JD033454).

Line 72, I would suggest changing "present" to "presented"

Line 103, "reanalyzes" should be "reanalyses"?

Line 129, As we know, it is more suitable to assume linear relationship between T and geometric altitude. When we use the altitude in hPa, I am not sure if the linear assumption between T and H is still robust or not. It might be okay when H (in hPa) varies within a small range.

Line 130, "Where" should be "where".

Line 147-149, since the description here is similar as that at Lines 137-139, the authors might simply indicate that "The OMR value signal and magnitude have the same meanings as ΔT ".

Line 157-158, the acronyms of the stations have already defined earlier, and no need to repeat.

Line 158-159, this sentence might be also not necessary.

Line 177-178, I would suggest "radiative forcing"

Line 200, "were" is suggested as "are"

Line 243, "present" should be "presents"

Line 245-247, potential errors in ERA-5 reanalysis data are worthy to mention, while it is widely used and believed to be reliable.

Line 289, "suspend" should be "suspended"

Line 295-299, the discussions here are great.

Line 341, "are" should be "is"