

The Tibetan Plateau (TP) exerts crucial impact on in the changes of regional and even global weather and climate through mechanical and thermodynamic forcings and affect the global energy-water cycles. A comprehensive data of tropospheric aerosol properties over the TP is important for understanding the TP effects on climate and environment changes. The T is highly challenging to obtain long-term in situ aerosol data due to its harsh environmental conditions. Therefore, this study provides the new dataset of vertical aerosol index (AI) parameter during 2007-2020 to investigate the aerosol climatology over the TP, which is suitable for the ESSD publication. Here list some of my main comments:

In eq. 2, $AI_{[m,i,j]}$ and $AOD_{[m,i,j]}$ are aerosol index and aerosol optical depth, respectively; $AE[m, i, j]$ is the pseudo-Ångström exponent; and $[m, i, j]$ represent the month, latitude, and altitude respectively. Note that to match the AE, AOD is also transformed into the vertical distribution (not the column parameter) (lines 280-283). Please add the process transforming the column AOD into the vertical distribution with MODIS-AOD data.

The authors use the ground-based LIDAR (Light Detection And Ranging) detection data from the hinterland of the Taklimakan Desert (not from the Tibetan Plateau) to verify the validity and accuracy of the low confidence aerosol removal method and the AI calculated by CALIOP detection data. Please add the discussions on the uncertainties in this study caused with distinct differences the Taklimakan Desert and the Tibetan Plateau.

the English language. Please make the substantial improvement on English language and usage in the manuscript. Below I list only a part of errors:

- 1) Line 38: more reliable the > the more reliable
- 2) Line 40: "between daytime and nighttime" should be for daytime and nighttime
- 3) Line 44: please clarify "all those facts"

- 4) Line 48: what is “aerosol troposphere” ?
- 5) Line 51: please modify “the recovered datasets”
- 6) Line 52: “the aerosol-cloud-radiation-precipitation interaction“? There should be the aerosol-cloud interaction (ACI) aerosol-radiation interaction (ARI)..
- 7) Line 100: models > modeling
- 8) Lines 107-108: please modify “and its
- 9) Line 172: please correct “between our record and with different data sets”
- 10) Line108: spatiotemporal pattern is primarily contributed to the Taklimakan Desert”.