Author's Response

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Title: Evaluation and comparison of MAIAC, DT and DB aerosol products over China
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We would like to thank the editor and the reviewers for their positive review on the manuscript acp-2018-1339. All the correction in this revision process are marked by red color. Following is our responses.

Reviewer# 1:
Please inter-compare the MODIS observation with some results of active remote sensing or model simulation and add some other remote sounding results in China.
1.   Huang, J., Minnis, P., Yi, Y., Tang, Q., Wang, X., Hu, Y., Liu, Z., Ayers, K., Trepte, C., and Winker, D., 2007. Summer dust aerosols detected from CALIPSO over the Tibetan Plateau. Geophys. Res. Lett. 34(18), L18805. doi:10.1029/2007gl029938.
2.   Jia R., Y. Liu, B. Chen, Z. Zhang, J. Huang, 2015: Source and transportation of summer dust over the Tibetan Plateau. Atmospheric Environment, 123(2015), 210–219, doi:10.1016/j.atmosenv.2015.10.038.
3.   Liu Y., Y. Sato, R. Jia, Y. Xie, J. Huang, and T. Nakajima, 2015: Modeling study on the transport of summer dust and anthropogenic aerosols over the Tibetan Plateau. Atmospheric Chemistry and Physics, 15(21), 12581–12594, doi:10.5194/acp-15-12581-2015.
Response: Thanks for your consideration on this points. We have compared the difference among satellite retrieved results, active remote sensing and model simulation in Page 2, Line 5-9. Suggested reference are accepted.

Reviewer# 3:
1.   Page 1, Line 23, "Yunan Province" should be revised as "Yunnan Province".
Response: Thanks for your carefully check on our manuscript. We have revised the "Yunan Province" into "Yunnan Province" in Page 1, Line 23 and Page 33, Line 8.

2.   In the title of Figure 2, how did the AODs divide into 50 bins, please specify it for future readers.
Response: We are sorry for a mistake in the number of bins. In fact, we separate the matchup pairs into 100 bins (not 50 bins) along with AERONET AOD values to obtain finer result. Then in each bins, we draw the bias boxplot and mean bias. Corresponding description is added in the title of Figure 2.

3.   In Figure 13, 14, and 16, the sudden change of AODs distribution related to MAIAC at the 30°N can be seen clearly. It doesn't make sense. I guess that there seems to be something wrong in the data processing or whatever, please check the MAIAC dataset and specify it in the context.

Response: The different aerosol model used in MAIAC algorithm for regions higher than 30°N and lower than 30°N is the reason for sudden change of AODs distribution. This is a limitation on MAIAC algorithm and firstly reported in Lyapustin et al., 2018. In our evaluation results, we also find this problem. The reason for the sudden change of AODs distribution are shown in Page 29, Line 17~18.

4.   The reference of Matins et al. (2017), mainly focused on validation of MAIAC product over South America, was cited frequently in this paper. Such as, the selection of spatial and temporal window, the definition of land cover type of AERONET sites, the strategy of comparison of retrieval accuracy and so on. Furthermore, All these seem to imply us that 1) the method of Matins et al. (2017) is superior or the most reasonably, 2) the difference between this paper and Matins et al. (2017) is only at location of the area of interest. So the authors should make a reasonable evaluation to the reference in the context. Furthermore, the reference of Zhang et al. (2019) in Page 2 Line 25 should be explained the relative simplicity of the assessment methods with more words, which will further demonstrate the comprehensive of the methodology used by the authors.

Response: Thanks for your suggestion! In fact, method used in Matins et al. (2017) is also applied in other validation studies. In the manuscript, we saved the reference of Matins et al. (2017) in the selection of spatial and temporal window and replace the Matins et al. (2017) reference in other validation method (e.g. Page 10, Line 3-4; Page 12, Line 8; Page 19, Line 4). In comparison with the work of Matins et al. (2017), we also evaluate more aspects than theirs work, e.g. view geometry dependency analysis, spatiotemporal retrieval accuracy analysis and spatiotemporal completeness analysis, etc.

The validation approach used in Zhang et al. (2019) are added Page 2, Line 28-30.

5.   Page 10, Line 5, the different definition of EE envelope can be found in different reference, how did you consider it and please specify it in the context.

Response: Commonly used EE envelopes may be $\pm(0.05+0.15\times AOD)$ and $\pm(0.05+0.2\times AOD)$. We select more strict EE envelopes $\pm(0.05+0.15\times AOD)$ in our studies. The EE envelope used in our study can be found in Page 10, Line 4.