

Interactive comment on “Satellite observed indications of aerosol effects on warm cloud properties over Yangtze River Delta of China” by Yuqin Liu et al.

Anonymous Referee #1

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The authors analyzed a set of satellite retrievals on cloud properties and AOD to examine the effect of aerosols on the low warm cloud over the Yangtze River Delta region of China. The relationships between AOD and several cloud properties, i.e., CDR, CF, COT, and CTP, were examined by using least square correlation analysis. Furthermore, the physical interaction of cloud and aerosol, different aerosol types and meteorological conditions were also taken into account in the analysis. In general, the manuscript is well organized and the analysis is to some extent comprehensive. It is recommended that the manuscript can be considered for publication after the following specific comments being addressed.

Specific comments:

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1. Page 1, Line 21: $AOD < 0.3$ and $AOD > 0.3$
2. Abstract: it would be much helpful if the authors could highlight the overall significance (or implications) of the present study at the end of the abstract (and also in the conclusion section).
3. Page 2, Line 3: change “, and second,” to “. Second,”
4. Page 2, Line 10: and clouds, and the aerosol activation efficiency. . .
5. Page 2, Line 25: and/or
6. Page 3, Lines 19-21: “when using MODIS data” is strange. Rephrase this sentence.
7. Page 4, Line 20: Description of the study region
8. Page 5, Figure 1: show in the plot what is the color-coded legend for, AOD?
9. Page 6, Line 7: delete “also”.
10. Page 6, Line 8-9, “CloudSat was the first mission to fly the first. . .” rephrase this sentence.
11. Page 7, Table 1: reformat the table, especially the first column.
12. Page 8, Line 2: g m⁻²
13. Page 10, Line 19: replace “CTP” by “CTH”
14. Page 12, Line 20: delete “can”.
15. Page 12, Lines 21-22: on the disagreement with the previous findings, can the authors comment on the possible reason?
16. Page 15, Section 3.3.2: what chemical compositions do the smoke aerosols identified by the CALIOP retrievals contain (I presume carbonaceous aerosols)? Please elaborate.

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17. Page 17, Figure 7: the discrimination between low and high RH conditions in the Figure caption (52% and 83%) is inconsistent with the numbers shown in the plot (56% and 85%). Please clarify.
18. Page 17, Lines 7-9, “associated with how aerosol particles...”: rephrase this sentence.
19. Page 18, Line 10: define “BL”.
20. Page 18, Figure 8: delete the second “mixed aerosol-cloud layers under” in the Figure caption.
21. Page 20, Figure 9: delete the second “mixed aerosol-cloud layers under” in the Figure caption.
22. Page 20, Conclusions: the conclusion section is too long. It would be better if the authors could concisely summarize the major key findings of this study, other than listing all of the activities and results, in the Conclusion section.
23. This study focuses on the Yangtze River Delta region, but the discussion of results is somewhat general. It doesn't mention what results are unique for the target region. It would be helpful if the authors compare the results in this study with those obtained from other areas in the world, and comment on if any uniqueness of aerosol effects on clouds in the target YRD region.

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