

Referee #2 comments:

I think the authors have fairly addressed all my concerns during my first round revision. Only minor remarks can be incorporated (optionally). The exception is formatting that suffers from some structural+language caveats and oversights that should be addressed.

AR: Thanks. We have reviewed, revised and responded according to your comments point by point. Besides, we also checked and revised the language and the format throughout the manuscript.

Abstract

- It's up to you, but it's better to avoid even such common technical terms like  $R^2$  unexplained

AR: Thanks. We have replaced “corresponding  $R^2$  values” with “the corresponding coefficients of determination”.

- I would nail down the abstract with one strong implication sentence, explaining scientific significance of this paper. You may recall three implication recommendations I provided in the first iteration as examples, but you can come up with your powerful closing remark indeed.

AR: Thanks for the suggestion. The sentence that “This study deepens the understanding of the correlation between marine aerosol optical properties and wind speed based on the synergy of aerosol and wind observations from Aeolus, demonstrating their relationships are more complex than a linear or exponential relation.” has been added in the final of the abstract.

Introduction

- You refer to 5th IPCC report, while the latest report is #6, why you refer to #5 then? Especially given the fact you mentioned IPCC 2021 report reference later on

AR: We found the statement “According to the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report, the total emission of marine aerosol (including marine primary organic aerosol) produced from ocean is 1400 to 6800  $Tg \cdot yr^{-1}$ , which is considered the largest natural aerosol input to the atmosphere globally” in 5th IPCC report, but not in IPCC 2021. So we decided to refer to 5th IPCC report here.

Instrument Description and Methodology

- Line 143. Do we need a reference for Baseline 14 reprocessing here? Just thinking

AR: Thanks. We supplemented the website of the “Aeolus Online Dissemination System” as a reference here, which is shown as “(<https://aeolus-ds.co.esa.int/oads/access/>, last access: 16 February 2023)”.

- 2.2 Once again, I think giving names of instrument and satellite itself using slash might be misleading.

AR: Thanks. The title of the section 2.1 and 2.2 has been revised as “ALADIN” and “CALIOP”.

- You refer to Figure 2 (line 171) earlier than to Figure 1. This is not correct from format point of view and it will be most likely highlighted as an error during proof-read

AR: Thanks. We moved the sentence referring to Fig. 2 to the final sentence of section 3, which is shown as “The procedures of the study methodology are summarized in a flowchart, shown as Fig. 2.”

Results

-Figures 4-7. Too many figures one by one to comprehend through text-figure reading. It's very inconvenient. Also, technically it might be wrong because you discuss Figure 7 after you showed it. Normally, you describe the results in the figure BEFORE you show this figure in the manuscript. It is strongly recommended only to mentioned previously described figures after these figures are shown,

but not to discuss them in such details. Once again, think about a general reader.

AR: Thanks for the advice. We have rearranged the order of the text and figures to ensure that the detailed descriptions of the figures are all before the figures.

- Line 470. I am not sure that research can be used as countable noun ("researches", not sure it's correct here and elsewhere). Moreover, add these "all previous studies" as references here. If you say "almost all the previous researchers", then one may wonder, which studies were not focused on this aspect? You may add one short remark on that.

AR: We replaced "almost all the previous researches" with "almost all the previous studies". In the introduction section, we mentioned a study focusing on extinction of marine aerosol and wind speed (Shin et al., 2014), so we decided to retain the description that "almost all the previous studies".

Reference:

Shin, D. H., Müller, D., Choi, T., Noh, Y. M., Yoon, Y. J., Lee, K. H., Shin, S. K., Chae, N., Kim, K., and Kim, Y. J.: Influence of wind speed on optical properties of aerosols in the marine boundary layer measured by ship-borne DePolarization Lidar in the coastal area of Korea, Atmospheric Environment, 83, 282-290, <https://10.1016/j.atmosenv.2013.10.027>, 2014.

Summary and Conclusions

- Lines 571-572, mentioned not only ALADIN, but Aeolus as well as the latter term is more known for remote sensing community not directly working with the ALADIN data. Let alone, it's a more known term for general readers for the mission.

AR: Thanks for the suggestion. The sentence has been revised as "By utilizing particle optical properties data (Level 2A products) and wind vector data (Level 2C products) provided by ALADIN onboard Aeolus satellite, and L2 vertical feature mask (VFM) products provided by CALIOP onboard CALIPSO satellite, the optical properties at 355 nm of pure marine aerosol are derived." in the revised manuscript.

Format

- Perform a thorough language and format check, you have some caveats like trailing spaces (line 70 for example). Wrong verb ("is" instead of "are" in Line 96) use. Wrong tense use ("flies" in line 128, while Aeolus is not flying anywhere anymore, so it's technically wrong). It's not a good sign for final version of the paper. Your paper should be well readable by general readers.

AR: Thanks. We checked the language and the format throughout the manuscript and corrected them as far as possible.