

## **Replies to Referee comments**

*On “Interactive comment on “Spatio-temporal aerosol optical characteristics over the Arabian Sea during the pre monsoon season” by D. G. Kaskaoutis et al.*

### **For Anonymous Referee #2.**

The authors have presented nice scientific information which will be useful for future generation who is working on aerosol heterogeneity and derived parameters. But anyway some drawbacks have been identified while preparing the manuscript. Kind attention is needed in technical check up of English grammar before its publication in ACP.

**Reply: We thank the reviewer for the summary evaluation. We have taken care of the English Grammar, to our best in the revision**

1. In abstract line 6, better to use “high accuracy” instead of “accurate”. Please correct the sentence in proper way.

**Reply: The sentence has been modified accordingly.**

2. In abstract line 11, error in AOD and alpha should be terminated to two decimals.

**Reply: We agree and have corrected it.**

3. Page 22229, line 14, delete the sentence “while \_ contains information ... in the atmosphere”. Re-state that sentence.

**Reply: The sentence has been modified.**

4. Page 22232, line 8-9, correlations between errors in  $a_1$ ,  $a_2$  and \_ is strongly positive. I think this is not that much strong significant correlation in my consideration. Give justification.

**Reply: This sentence is omitted from the revised version.**

5. Page 22232, line 20 onwards, the authors are quoting that for calculation of  $a_1$  and  $a_2$ , AOD<sub>1020</sub> is not taken into consideration as such it is associated water vapor strong absorption with produces larger uncertainties and errors. But almost in all figures the authors have been using AOD at 1020nm for the calculation of coefficients. Clearly justification is needed.

**Reply: In the calculation of  $a_1$  and  $a_2$  we do consider AOD<sub>1020</sub> for spectral range (340-1020) where as it is excluded for the other range (340-870). This is one of the main ideas of this study to understand the range dependent errors to know the technical and physical inferences. Moreover, in the data collection (section 2) we discuss in detail the possible uncertainties in the**

**AOD at 1020 nm, which were found to be small taking into account the literature (Eck et al., 1999) and the measured PW amount. In none part of the text we quote that the AOD<sub>1020</sub> was omitted from the analysis.**

6. Page 22236, explain the terms 'condensation' and 'coagulation' processes which are helpful in producing fine mode aerosols.

**Reply: Condensation is phase transformation process from gaseous matter to liquid and this results in fine droplets or particles with sizes ranging from a few to few tens of nanometer. These are referred to as fine mode aerosols. Coagulation is process of collision and coalescence of the numerous small particles to form a few number of larger particles. These particles having sizes ranging from a few tens of nanometer to nearly a micrometer and are called accumulation mode particles. Particles larger than 1 micrometer are generally called coarse-mode particles. These are now incorporated in the revised version.**

7. Page 22242 lines 15-16, the authors are confusing the readers. Some bad sentences are constructed. What do you mean "free troposphere".

**Reply: This sentence has been corrected as 'upper levels of atmosphere (above the ABL)'**

8. Page 22243; mention the geographical coordinates for KCO and Maldives.

**Reply: The latitude and longitude coordinates have been provided in the text. Note that KCO belongs in the Maldives.**

9. Page 22246, line 25, "part of AS, especially in Fig. 16a. Where is Fig. 16a?"

**Reply: The mistake has been corrected now.**

10. In figure 1, why the authors have taken the ship position at 05:30 UTC.

**Reply: Just for a convenience to indicate. Any other time also would be equally ok. As the cruise covered a wide longitude range, we thought it is better to show the daily position according to one common time.**

11. I request authors to take necessary care in aligning the figures 11-15 as such magnitudes of values and border lines are missing.

**Reply: The necessary and all possible care have been taken on the suggested point.**