

## ***Interactive comment on “An analysis of the Collection 5 MODIS over-ocean aerosol optical depth product for its implication in aerosol assimilation” by Y. Shi et al.***

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Review by editor.

The paper is of interest to ACP and should be published once the authors address the point about bimodality raised by referee 1, and the points below. I would like to see the responses of the authors and, of course, the revised paper, but I expect this to be a formality.

P. 2, L. 3: There seems to be a bracket missing.

P. 4, L. 7: Could you provide an indication of the percentage error associated with a

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value of 0.015?

P. 4, L. 15: I suggest replace “blur” with “overcome”.

P. 4, L. 19: Is it not the case that a height-resolved satellite retrieval represents a 3-d spatial observation (2-d in the horizontal plus a vertical range). Could you clarify this?

P. 5, L. 16 and elsewhere: Do you mean “over water” (to include ocean and lakes) or “over ocean”? You use the term “over ocean” almost elsewhere in the paper.

P. 6, L. 17: “refer” -> “referred”.

P. 6, L. 20: “on MODIS retrieved” (replace “to” with “on”).

P. 7, L. 3: “year” -> “year’s”.

P. 7, L. 8: “however, this is beyond”.

P. 7, L. 17: I suggest: “Following improvements made to the MODIS C5 aerosol product (Remer et al., 2008), a nine-year analysis was performed and compared with the one year of analysis from Zhang and Reid (2006).”

P. 9, L. 25: Is Eq. (5) a fit? What is the (typical) residual given the parameters calculated?

P. 10, L. 6: I suggest: “Both Zhang and Reid (2006) and this study suggest that biases in the over water MODIS AOD data can be characterized by cloud fraction and the ‘nu’ value.”

P. 10, L. 21: Is Eq. (6) a fit? What is the (typical) residual given the parameters calculated?

P. 10, L. 27: “details of the”.

P. 11, L. 21: “Figure” -> “Figures”.

P. 11, L. 24: “decreases for all”. For all what?

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P. 12, L. 15: I suggest: "Terra C5 and the data produced in this study." And I suggest a similar change in L. 17 and in P. 13.

P. 12, L. 18: "noises"-> "noise".

P. 13: Kindly reword: "The cloud contamination introduced fluctuations of RMSE are weakened, indicated that the cloud introduced uncertainties and noises are reduced."

P. 13, L. 15: I suggest "As discussed above". Unless you mean something else by "before".

P. 13, L. 16: I suggest "troublesome"-> "problematic".

P. 13, L. 20: I suggest: "we estimate that over the southern oceans the corrected MODIS AOD data have 30–35% of RMSE reduction compared with the original MODIS AOD."

P. 14, L. 1-2: Is there a pattern in the improvement? Is this better over particular areas?

P. 14, L. 12: Define 'nu' to aid the reader.

P. 14, L. 19: "over the southern oceans".

P. 15, Hogan et al. reference: Check the style, should all text (e.g. TDOTNO) be there?

P. 20, Fig. 2 caption: I do not understand the comment of "large AOD cases" after "red lines". The red lines go down to zero, albeit with a break. Please clarify.

P. 24, Fig. 6 caption: I would say the black colour represents land, so no data (as only the ocean is considered). Otherwise your statement suggests that there are areas over the ocean without data. Is this the case?

P. 25, Fig. 7 caption: "comparing" -> "compared".

P. 26, Fig. 8 caption: "comparing" -> "compared".

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