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Atmospheric Chemistry and Physics Discussions



# *Interactive comment on* "Deriving the effect of wind speed on clean maritime aerosol optical properties using the A-Train satellites" *by* V. P. Kiliyanpilakkil and N. Meskhidze

**Anonymous Referee #2**

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In this paper the authors make use of satellite datasets to study the optical properties of marine aerosols and their relationship to surface wind speed at different locations over the World's ocean. Although this subject was previously studied in numerous researches, by using data from CALIPSO the authors provide an innovative and interesting perspective that contributes to our understanding of an important constituent of the climate system. As noted by the authors, the use of CALIPSO has several advantages, including providing a unique view on aerosols vertical distribution, having the ability to observe aerosols during night-time and reducing the retrieval uncertainty at low AOD conditions.

Results from this research are in agreement with previous studies , while several discrepancies are addressed and discussed by the authors. In addition, the methodology applied by the authors seems to be efficient in distinguishing between marine aerosols and other aerosols found over the ocean.

Overall, the paper is well written and contributes to our understanding of over-ocean aerosols and specifically on the relative importance of its wind induced marine component.

Specific comments

Figure 1: The colour-scale should be changed so that it captures more variability patterns (there is no use in stretching it further than something like 0.11).

Since one of the important contributions of this work is the information on marine aerosol's vertical distribution, I strongly recommend separating the information presented in Fig. 3 to different regions and seasons. I suspect that in its current form, Fig. 3 filters out much of the spatio-temporal variance in marine aerosol distribution, thus being of little relevance.

Given the very low number of samples at very high wind speeds (histogram in Fig. 5 and first paragraph in page 4611) I think it would be more correct not to include data associated with wind speeds higher than $\sim$18m/s. The authors statement that "Removal of these points also does not change the conclusions drawn from the data analysis" (page 4611, line 10) is not correct from a physical point of view, since removal of these data-points would prevent having a state of "saturation" in marine aerosol loadings (as hypothesized at line 10 of page 4613). Note that this would also be the case if excluding the last data point in Fig 5.

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