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Interactive comment on “Multi-sensor Aerosol Products Sampling System (MAPSS)” by M. Petrenko et al.

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Dear Reviewer,

we would like to thank you for the relevant feedback and take this opportunity to answer the posted questions.

>a) the very important warning against direct use of the potential >oversampling in the MAPSS AERONET dataset (p. 918, l. 16-22) >is very important and should also be repeated in the conclusions

We agree with this suggestion, and will add the following precaution to the Conclusions section of the paper:

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“Prospective users of MAPSS are encouraged to study data usage guidelines and precautions provided in Sections 3.1-3.3, in order to avoid possible data quality and oversampling biases.”

>b) tab 3 and 4 have only a very brief explanation in the text, >which could be extended (p.921, l. 1-12)

We propose the following extension to the relevant paragraphs of the paper (this additional text is in the square brackets):

“To test whether the approach of screening the already computed statistics of the aerosol parameters based on the statistically aggregated values of the QA flags (Ichoku et al., 2002, 2003) has the potential of being less effective than screening individual pixels using their respective QA flags before computing the sample statistics discussed above, the two approaches were compared as outlined Table 3 and Table 4. [In these tables, mean and cval values of AERONET AOD were compared to the corresponding mean and cval values of MODIS AOD and OMI AOD. This comparison considered several data quality filtering scenarios: a) no data filtering - mean and cval values for a subset were based on all pixels in this subset; b) mean and cval values were based on all pixels in a subset, but only if the mode of QA flags over this subset was ‘Best’ (i.e., 3 for MODIS and 0 for OMI); c) mean and cval values were based only on those pixels in a subset that had the ‘Best’ QA flag. The additional factor considered in the comparison was the number of the data pixels in the compared subsets (i.e., nval).]

It was found that the screening of the aerosol parameter subset statistics by their QA mode produces results that are similar to the screening of individual pixels by their QA before computing the statistics, although the former method results in slightly fewer data points, since an entire subset can be rejected based on the average QA value even if some of its component individual pixels have good QA flags. However, this is a small trade-off compared to the increased amount of effort involved in pre-screening before statistics.

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[A closer inspection of the data also revealed that, for MODIS land and ocean products, the QA mode screening improves the accuracy of the subset statistics, compared to the approach of screening the individual pixels. Also, the increase in the subset data pixel counts (nval) further improves the correlation between AERONET and MODIS observations. Conversely, for MODIS Deep Blue and OMI aerosol products, the screening based on QA mode produces somewhat less reliable results than the screening of individual pixels, where higher nval values are also associated with the less reliable correlations to the AERONET measurements. These observations indicate a certain inhomogeneity that is present in the data quality of the two products, where, in some cases, the QA flags of individual pixels might not be representative of the overall data quality of the sample (e.g., subpixel cloud contamination of individual pixels in OMI retrievals), although a more detailed study is needed.]”

>c) p. 923 /l. 8: is "reflectance" TOA or surface, here?

In this context - it is a TOA reflectance, since MODIS Level 2 aerosol products (MOD04 / MYD04) provide only TOA reflectance, while surface reflectance is available from other MODIS products. We will clarify this issue in the paper as the following:

“For example, AOD, Fine Mode Fraction, Top of Atmosphere (TOA) Reflectance, and other aerosol parameters in the Aqua MODIS aerosol product (MYD04), sampled at 18:08 UTC over the GSFC site on 2010-07-06, comprise a single data record, whereas mean, sdev, mcoc, and other statistics computed from the data sample for AOD at 550nm constitute a single statistics record.”

>d) fig. 9 caption - talks of top/bottom image, should be left/right

Thank you for this correction.

Thank you,

Maksym Petrenko

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