

Interactive comment on “Improving satellite retrieved aerosol microphysical properties using GOCART data” by S. Li et al.

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General Comments:

The article aims to improve MISR aerosol optical properties by incorporating information from model-simulated (GOCART) aerosol properties, as MISR's ability to retrieve aerosol properties is weakened at low AOD levels. The authors propose a post-processing technique to improve MISR aerosol retrievals by constraining MISR mixtures' ANG and absorbing AOD (AAOD) using the GOCART aerosol simulations. Specific aerosol mixtures are selected when the differences of ANG and AAOD between MISR and GOCART are below a certain threshold.

This topic is important and such a study is valuable, but some more works need to be

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done before its publication (see specific comments). Overall, this paper is hard to read. The abstract is too long.

Specific Comments:

P8954, eq.(4): α is the ANG, right ? explain it in the context.

P8954, L22: do you use three wavelengths? Rewrite this sentence to make it clear.

P8955, L8-9: Hard to understand. Please rewrite this sentence to make it clear.

Figure 1: hard to understand. Please put component fractional optical depth in a separate panel.

Figure 3 and other figures: It is better to give the bias and RMS error instead of “Diff”.

P8956, L29: AOD > 0.2, the MISR retrieved AOD, right ? why not show the corresponding points in the top panels, as in the lower two panels of Figure 3? Why the points in the bottom panels are much less than the middle panels ? you need to explain it in the caption of Figure 3.

Unfortunately, the GOCART simulations barely catch the variation of AOD, ANG and AAOD from the right panels of Figure 3, i.e. the observations from AERONET show a much large variation than GOSAT. So, I doubt the performance of this algorithm by incorporating GOSAT data to constraint the selection of mixtures in MISR products. Try to limit the AOD < 0.2 and plot these points in red colors in the right panels, recalculate the correlations between GOSAT and AERONET. Guess only using the GOCART data with AOD < 0.2 may help to improve this MISR product, where the MISR product is poor as described in this paper, and this criteria should be add in the algorithm. Similarly, since ANG > 2 can not be simulated by GOCART, is it helpful to add it as one criteria in the algorithm ?

Figure 4: hard to understand. More description about how this figure is generated using simulation data should be added.

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Table 1 is too complicated and it is better to show it in a Figure, or make it simpler.

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