

Interactive comment on “Combining low-cost, surface-based aerosol monitors with size-resolved satellite data for air quality applications” by Priyanka deSouza et al.

Anonymous Referee #2

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Review of ‘Combining low-cost, surface-based aerosol monitors with size-resolved satellite data for air quality applications’ by Priyanka de Souza

This work deals with the combination of low-cost sensors combined with satellite data to obtain PM_{2.5} near surface. The novelty of this technique has no doubt and the implications in the aerosol science community are huge. Authors include the shortcomings and other issues related to the technique. Methodology is well described too.

However, I have concerns before recommending the final publications. As the other referee suggests and even the authors admit, the technique needs evaluation versus other instrumentation that provide accurate PM_{2.5} measurements. Authors must pro-

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vide at least a intercomparisons of low-cost sensors with reference instrumentation and provide a plan for future evaluations of the methodology in places with more advanced instrumentation.

I have also other concerns:

With the hypothesis related to MISR retrievals and aerosol vertical distribution, why not doing intercomparisons directly with MERRA-2 data?

What are the peculiarities of Alphasense OPC versus other low-cost sensors?

It is difficult to follow the methodology section. At least a Flow chart is needed. Also, I get confused in the intercomparisons because you make mention to number concentration in MISR and mass concentration with the sensors. That must be clarified.

The results section is not clear. Much information from the supplement must be included in the paper as supplement seems an independent paper.

Minor concerns:

Line 46: Latest development in technology has reduced the cost of accurate instrumentation. Please, be careful

Line 73: Be aware that new satellites are improving the spatial resolution

Line 110: Please, add references.

Line 212: What uncertainties are you referring to?

Line 220: MODIS also assumes certain aerosol types and can provide an estimate of particle size distribution. Please check

Lines 244-245: Why do you need gases from GEOS-Chem? Please avoid unnecessary information because paper is already too long.

Lines 353-354: AOD is by definition over the vertical, so your definition is not correct. Are you referring to aerosol optical thickness? Please correct. Lines 442-448: Here is

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what I do not understand about particle density. Why do you need that?

Results: I do not understand what do you mean about Analysis 1, 2, 3, 4 y 5

Tables 1 and Tables 2 need further explanations.

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