

## ***Interactive comment on “Validation of CAMS AOD using AERONET Data and Trend Analysis at Four Locations in the Indo-Gangetic Basin” by Amit Misra et al.***

### **Anonymous Referee #2**

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The manuscript deals with validation of CAMS data using AERONET network data from four stations in Indo-Gangetic Basin over ten years. It brings some useful basic comparison of data but the methods are not described in sufficient detail so that the results could be compared/used for some other studies. The presentation may be also improved.

Specific comments: It is not clear what the aerosol climatology should be – annual cycle? Annual mean? Or the 10-years averages?

Also within the MS, it is not clear what time resolution are individual analyses based on – monthly data, annual means? For example, L218 etc.

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In the abstract, the level of details varies a lot – for example while it is not clear what data were used for comparison, trend of sea salt in Kanpur is given. . .

What meteorological variables aid to build up aerosol in the region? Please be more specific, is it inversions, pressure field, any wind feature? L46

It is necessary to describe the AERONET data used in the comparison –instruments type and manufacturer, wavelength used, data validation procedure, sampling frequency, data coverage, etc. The measurement location could be also plotted in a figure.

What would be the source of the smaller particles at Gandhi College? L173

Several times through the MS, the source of the particles, air flows etc. are discussed without any analyses to support the claims – could back trajectories clustering be applied, or CPF or PSCF functions calculated?

It is not clear why the monsoon periods were not location-dependent in the comparison? If they were, the results discussion would be easier (L230. . .)

Is it possible to highlight what is new in the section 4.3? It looks only as a description of data without any new analyses?

Any idea what the different phenomenon governing aerosols in Lahore could be? L305

For all the plots, units need to be added, and annual cycle used instead of climatology. The uncertainty is mean  $\pm$  st .dev? Not stated. In Fig 1, the monsoon periods could be highlighted in the plots and a different color for NDVI used, as it is not easy to distinguish between NDVI and AE. In Fig. 4/Table 2, was the statistical significance of the trend tested? Some of them seem quite constant.

Technical corrections: - PM does not cause only lung cancer L20 - instead of microns, use of  $\mu\text{m}$  would be preferable? L20 - central IGB is dominated by coarse mode? L56 - paragraph L76 to L78 only repeats the previous text - What climate factors did you

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consider? L61 - Would not it be preferable to take the same period for all stations for a better comparability? L123 - One-month shift is not “very different” pattern? - How did you estimate the fraction of coarse particles? L182 - Was there different time span in 4.4. part or is it a typo? L308

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