

We thank the reviewer for his/her helpful comments and questions. Below is our point-by-point reply. We have also revised the manuscript according to the comments.

This manuscript by Lie et al., "Recent Trends in Aerosol Optical Properties Derived from AERONET Measurements", presents trend analysis of AERONET data at 63 sites. This is an interesting and straight-forward study. Moreover, this is very clearly written manuscript. This analysis is important and well justified, if the data quality is thoroughly considered and turns out to be sufficient. However, I have essentially one major comment, but I consider it strong and major enough to mean also substantial new work; it has to do with the use of level15 data for your analysis. It is true that level15 has been used in some previous analysis, but it is particularly questionable for trend analysis. There is a set of level2 criteria for the inversion data set, which has several other requirements apart from $AOD_{440} > 0.4$. It seems that you did not use them either to filter the data for a better quality? Is this correct? It might not change the results of some of the sites, likewise some of them would likely change; but why not to use the data with the best possible accuracy? By a very quick glance, I suspect that the results of Hong_Kong_PolyU, for example, might get different with level15 data filtered with level2 criteria other than AOD threshold. For instance, SSA retrievals in level15 there show a systematic pattern of increased SSA, when "sky_error" increases above level2 threshold. On the other hand, the annual average "sky_error" seems to increase slightly, for some reason, in 2006-2013 period. Therefore, different set of retrievals is sampled, if level2 quality criteria are ignored totally than in the case when the data are filtered for a better quality. Anyway, even if the results of this site would not change, it is fair to require that appropriate effort is taken to use the data with best possible accuracy.

Thank you for the comments. In the original submission, we did not use Level 2.0 quality control criteria to filter the Level 1.5 data. In the revised version, we re-processed and re-selected the data and stations using three quality control criteria, according to the suggestion by Dr. Tom Eck, which are solar zenith angle > 50 , sky error $< 5\%$, and only using data therefore which there is coincident Level 2.0 AOD data to ensure the quality of input sky radiance. Moreover, according to Dr. Eck, the 0.5 threshold for SSA might not be appropriate, and SSA seldom gets below 0.7 for Level 2.0 data. Therefore we changed the SSA threshold to 0.7. This results in a 3.65% reduction of the data volume and the low SSAs are usually associated with low AODs (see the response to Dr. Eck for the detailed discussion and figures). In the revised manuscript, we updated all figures and tables using the new dataset. The additional screening did not change the sign or significance level of the trends for the majority of the stations, although the magnitude of the trend changes due to the changes in data selection. We also separated the discussion of the Level 2.0 and Level 1.5 results, and emphasized that Level 1.5 results are subject to greater uncertainty.

Did you include all the AERONET sites that passed your requirements to form the longterm time series? So GSFC and Solar Village, for instance, that both have long time series did not pass or is there some other reason that they are not included?

Thank you very much for pointing out this problem. We re-checked the selection algorithm and found a bug that accidentally excluded all stations whose first measurement was made prior to 2000. This mistake resulted in the loss of many long term stations with good data quality. Also, in the original version of this study, the selection of a station was based on the Level 1.5 data, although we were using Level 2.0 AOD and AE from the direct sun measurements for the AOD and AE trend analysis. This also resulted in the exclusion of some stations that have good Level 2.0 direct sun retrievals but less Level 1.5 inversion retrievals. In the revised manuscript, we completely updated the selection algorithm. We (1) corrected the bug to include the qualified long term stations (first measurement made prior to 2000); (2) The direct sun measurements and inversion products are selected and analyzed separately, i.e., for AOD and AE, we selected 90 stations from Level 2.0 direct sun measurements that pass the data record requirement described in Section 2, for ABS, SSA and AAE, 7 Level 2.0 stations are selected, and 44 additional Level 1.5 stations are selected.