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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Recent trends in aerosol optical properties derived from AERONET measurements" *by* J. Li et al.

Anonymous Referee #1

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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 AOD440>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

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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.

Did you include all the AERONET sites that passed your requirements to form the long-term 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?

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 14351, 2014.