

Response to Editor

Dear editor,

We thank you very much for the comments and suggestions. The comments and suggestions are valuable and very helpful for revising and improving our manuscript. We have made revisions according to the referees' comments and suggestions, as described in the authors' response.

Comments

Dr. G. P. Gobbi and three anonymous referees have posted their comments in the interactive discussion of your manuscript. You should post Author's Comments in responses to their comments before submitting your revised manuscript.

Regarding to the AERONET data publication guidelines, you should convince the editor and referees that the PIs of each site involved are content with your response to Dr. Gobbi's comment and accept to be credited by acknowledgement instead of co-authorship; otherwise, you should invite them to be the co-authors of your manuscript.

Under the condition that the AERONET data guidelines issue has been settled, you can go further to make revisions of your manuscript. Please consider the referees' comments seriously, especially on AERONET data quality and uncertainties in AE. You can submit a revised manuscript only if you think these questions have been well addressed. In addition, please try your best to improve the presentation of your manuscript, with the current version of which all the referees and also this editor are not satisfied.

Although the referees have recommended a submission of revised manuscript, this does not ensure that your manuscript will move to ACP for final publication. Your revised manuscript will certainly be sent to the referees for recommendation.

Response

We are really very sorry about the improper use of data due to my carelessness. We do our best to gain their forgiveness. We have consulted with them, Prof. Arnico Panday (Pokhara PI) and Prof. Zhiyuan Cong (QOMS_CAS PI) have agreed to be the co-authors and improve the paper quality with us. Prof. Gian Paolo Gobbi agreed us to use the data, and recommended that we only added acknowledgement. Therefore we have added 'We thank G. P. Gobbi (ISACCNR) and G. P. Verza (EVK2-CNR), for their effort in establishing and maintaining the EVK2-CNR AERONET site. We thank A. Panday and Gupta Giri for their effort in establishing and maintaining the Pokhara AERONET site. We thank Z. Y. Cong for his effort in establishing and maintaining QOMS_CAS AERONET site.' in the acknowledgement of the new revised manuscript.

For the AERONET data quality, the quality of level 1.5 data is actually poorer than level 2.0. However, level 2.0 data are not enough to provide continuous records to analyze the aerosol optical properties, especially for QOMS_CAS station. Therefore, level 1.5 data are used in the case of lacking level 2.0 data. Some unreliable

measurements are eliminated before the statistical analysis. And we think the exclusion of unreliable data can improve the data quality to some extent. The median, rather than the mean is used to represent the seasonal variations. Some extreme events would not have great influence on the analysis of results. Data that within a day are less than five hours would be excluded in calculating diurnal variations, and this can also improve the data quality.

Using the equation in the recommended reference of Referee#1, the uncertainty of AE has been estimated in the revised manuscript. We added this estimation of AE uncertainty in Section 2.2 in the revised manuscript. The sentences are ‘The equation

$\Delta AE = (\varepsilon_{\lambda_1}^2 + \varepsilon_{\lambda_2}^2)^{\frac{1}{2}} / \ln\left(\frac{\lambda_1}{\lambda_2}\right)$ can be used to estimate the uncertainty in AE where ε_{λ_1} and ε_{λ_2} are the uncertainties in AOD at two different wavelengths (Hamonou et al., 1999). If the uncertainties in AOD at different wavelength are set to the same value, the uncertainty in AE can be estimated by a simple calculation. When the uncertainty value of AOD is 0.01, the uncertainty in AE at 440-840nm is about 0.02. When the uncertainty value of AOD is 0.02, the uncertainty in AE at 440-840nm is about 0.04. Even if uncertainty in AOD is about 0.05, uncertainty in AE is about 0.10. Compared to the value of AE, uncertainty is low enough and has no significant effect on the results in this study.’ From the above simple calculation, we can know that the uncertainty of AE has no significant effect on the results. And the results are reliable in this study.

We try to do our best, and English writing has already been further polished in the new revised manuscript by one co-author (Prof. A. Panday, Department of Environmental Sciences, University of Virginia, Charlottesville, Virginia, USA) now.