

Interactive comment on “Similarities and differences of aerosol optical properties between southern and northern slopes of the Himalayas” by C. Xu et al.

Anonymous Referee #2

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Using AERONET data at 3 stations located in the Himalayas, the authors discussed aerosol optical properties in this key region. Different diurnal variation of aerosol optical properties was revealed and potential causes were discussed. This is an interesting research and the data set was valuable. However, the manuscript needs further improvement and polish in language before it is accepted for publication. General comments: 1. Different AOD between QOMS_CAS/EVK2-CNR and Pokhaka is mostly due to quite different elevation instead of large scale atmosphere circulation. Pokhaka is a city and heavily impacted by anthropogenic activities, so aerosol loading and optical properties are quite different from those at QOMS_CAS and EVK2-CNR. I'm not sure what's the

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objective of using Pokhaka in the comparison. My understanding is that further analysis of difference in aerosol optical properties between QOMS_CAS and EVK2-CNR should be emphasized. 2. Some case studies are required to show how long-range transportation of dust and anthropogenic aerosols impact QOMS_CAS and EVK2-CNR. 3. How to calculate FMF. 4. Because most AODs at QOMS_CAS and EVK2-CNR were less than 0.15, calculation of AE under this condition should not be free of large uncertainty, so in my opinion, it is not suitable to calculate individual AE when you talk about the diurnal variation of AE, it seems to calculate AE diurnal variation from multi-day mean individual AODs much better. 5. Figure 4 is misunderstanding. 6. Validation of AOD in the Tibetan Plateau and impact of dust aerosols in the Taklimakan Desert on aerosol loading in the Tibetan Plateau were shown in following reference Xia X., P. Wang, Y. Wang, Z. Li, J. Xin, J. Liu, and H. Chen, Aerosol optical depth over the Tibetan Plateau and its relation to aerosols over the Taklimakan Desert, *Geophys. Res. Lett.*, 2008, 35, L16804, doi:10.1029/2008GL034981 7. Improvement of our understanding of aerosol optical properties in China during recent years should be reflected in the introduction. The authors can refer to following important review papers Li Z., et al., Overview of the East Asian Studies on tropospheric aerosols, an international regional experiment (EAST-AIRE), *J. Geophys. Res.*, 2007, 112, D22S00, doi:10.1029/2007JD008853. Li Z. et al., East asian studies of tropospheric aerosols and their impact on regional climate (EAST-ARIC): an overview, *J. Geophys. Res.*, 2011, doi:10.1029/2010JD015257. 8. Language should be further polished; there are so many grammar errors.

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