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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Correlation of black carbon aerosol and carbon monoxide concentrations measured in the high-altitude environment of Mt. Huangshan, Eastern China" *by* X. L. Pan et al.

Anonymous Referee #2

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Review of "Correlation of black carbon aerosol and carbon monoxide concentrations measured in the high-altitude environment of Mt. Huangshan, Eastern China" by Pan et al.

This manuscript presents 3-year measurements of BC and CO on top of Mt. Huangshan. Instrument, measurements, and calibration have been described in detail. Correlation and back-trajectory analyses have also been presented. Overall, the measurements seem solid and the manuscript is well written. However, there are some questions regarding their analysis and conclusions. My comments are listed below. I rec-

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ommend the manuscript be accepted for publication after re-analysis and manuscript revision.

Major comments:

1) Choice of data: As authors pointed out, there is an apparent difference between data taken during day and at night. I agree with the authors that the night air sampled is of relatively clean mid-tropospheric origin. If so, the night data should be separated from daytime data in the rest of analysis. The night data should be used for mid-tropospheric BC and CO loading assessment, while the daytime data can be used for boundary layer pollution study.

2) ΔBC/ΔCO determination and relation to emission inventory: The determination of ΔBC/ΔCO is a bit arbitrary. This is fine, but then the results can't be directly compared to the emission inventory. Furthermore, as pointed by M.O. Andreae, there might be a problem with the BC data. The BC data must be expressed as mixing ratios instead of densities. It should be pointed out that while it is difficult enough to determine emission inventories next to emission sources, it is practically impossible to do it two days later.

Minor comments: 1) P4453, L16: 1.4 factor- how is it applied?

2) P4453, L24-27: span calibration is not clearly described.

3) Just to repeat: Cluster analysis should use daytime data only!

4) P4459, L17-22: BC is never soluble. Do the authors mean "hydrophilic"?

5) P4459, L22: RH<50%?

6) Figure 3 should be larger

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