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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Atmospheric brown clouds reach the Tibetan Plateau by crossing the Himalayas" *by* Z. L. Lüthi et al.

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We thank the referee for his/her comments, which were very helpful to improve our manuscript. Below, we address the specific comments individually.

This paper by Luthi et al. discussed the atmospheric brown clouds crossing the Himalayas, which is very interesting and useful for future researcher, especially for subseting three different pathways for plume. However this paper needs to be minor revised before accepted by ACP.

My comments are as follows. Section 2.2 Line 5: "Night-time profiles shows lower background noise" Refine or support it with more information.

The information about the background noise in the CALIOP profiles is not crucial for the current study. We thus removed this sentence.

Section 3.1.1: Figure 4a is polluted and 4b is clean plots, while on Figure 4, no direct sign for a and b. And postion is opposite to default.

Labels a) and b) are added in the revised Figure 4 and the position is swapped to match the description in the text such that panel a) on the left depicts the polluted and panel b) on the right shows the cleaner episode.

For the back trajectories, 121 was selected on both sites. Please give more information, like why 121 and how they distributed.

Thank you very much for pointing this out. We agree that the choice of number and location of trajectories was insufficiently described in the original manuscript. The number and distribution of trajectory starting locations has been chosen based on our experience with similar studies. We started 121 trajectories from a rectangular grid centered at the station's (or plume) location. The number 121 originates from our choice of 11 grid points both in merdional and zonal direction. All trajectories are within 60 km distance from the center location and 121 trajectories were started at every height level from the surface to 2000 m above the surface. This ensemble of trajectories allows for a more robust diagnostic of involved air streams than single trajectory calculations. We have refined the description in the methods section 2.3 accordingly.

Some sentences needs to be re-written. Like Section 3.2.1 Line1-3.

The section was re-written more clearly. It now reads:

"Several CALIOP transects that were retrieved over the past years show significant extensions of pollution plumes "coating" the HTP. This indicates that the polluted air masses do not only accumulate in the valleys but can also cover large areas in this usually pristine region."

For most figures please enlarge the label for easy reading.

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We have enlarged the labels for more clarity in all figures.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 28105, 2014.

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