The authors thank the anonymous referee to review our manuscript and particularly for the valuable comments and suggestions that have significantly improved the manuscript. We have made most of the changes suggested by the reviewer and have outlined these in detail below.

Anonymous Referee #1

This paper reports the results of on-line airborne black carbon measurements at a unique site in the Qinghai-Tibetan Plateau, where the climate is very sensitive to anthropogenic activates. The data were collected using reliable and advanced instruments, including a SP2 and a PAX. The data were well organized and analyzed to present the concentration, size distribution, and mixing state of BC in this special region. Especially, the potential sources of BC in the polluted days were clearly identified, suggesting the importance impact of

I have two minor concerns.

1. The cutoff size for PAX measurement was $PM_{2.5}$, while what SP2 measured was particles of 100-1000 nm. To calculate the MAE value, this discrepancy should be evaluated.

Response: We agree with the reviewer that the cutoff size for PAX and SP2 are different. We have considered this point. Wan et al. (2015) investigated the size distribution of carbonaceous aerosol at the Nam Co Station in the Tibetan Plateau during 2012. They found that the concentration of black carbon in $PM_{1.0}$ accounted for ~85% of $PM_{2.5}$. If we used this percentage in our study, the MAE values would be overestimated by ~13%. In the revised manuscript, we added the following "The rBC mass absorption cross section (MAC_{rBC}, expressed here in $m^2\ g^{-1}$) is one of the most important optical properties for rBC aerosol because this parameter links optical properties to rBC mass. The MAC_{rBC} can be calculated by dividing the absorption coefficient measured with the PAX by the rBC mass concentration from the SP2 (MAC_{rBC} = [Absorption]/[rBC]). Due to the difference in cutoff size for PAX (< 2.5 μm) and for SP2 (<1.0 μm), the MAC_{rBC} may be overestimated by ~13% given that the concentration of black carbon in $PM_{1.0}$ accounted for ~85% of $PM_{2.5}$ in the Tibetan Plateau (Wan et al., 2015)."

2. In the back trajectory analysis, besides the altitude of 500 m, other altitudes like 100 m and 1000 m needs to be analyzed to confirm the source regions identified.

Response: Following the reviewer's suggestion, we have made back trajectory analysis with altitude of 100 m, 500 m and 1000 m. The results are now integrated into Figure 4 in the revised manuscript.

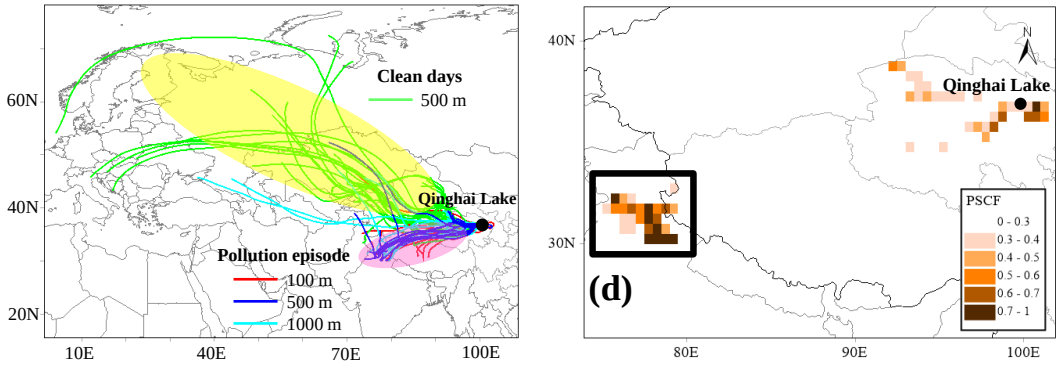

Figure 4. (a) Five-day backward air mass trajectories reaching at Qinghai Lake at 100, 500 and 1000 m above ground every six hours and (b) Likely source areas of rBC identified using potential source contribution function (PSCF) plots during the entire campaign.

Reference:

Wan, X., Kang, S., Wang, Y., Xin, J., Liu, B., Guo, Y., Wen, T., Zhang, G., and Cong, Z.: Size distribution of carbonaceous aerosols at a high-altitude site on the central Tibetan Plateau (Nam Co Station, 4730 m a.s.l.), Atmos. Res., 153, 155-164, 2015.