We feel terribly sorry for lines 168-173 mistakenly written lines 188-193 in uploaded files. The following is a correction.

[1. Fig 1 and Fig 2 demonstrate the key role of "warm cover" in the haze process. However, the illustration of the connection of "warm cover" with the Tibetan Plateau has lacked. The "warm cover" shown in Figure S1 is below 900 hPa, which is similar to the height of the PBL top. It results in a very stable ABL and further improves the surface $PM_{2.5}$ concentration. However, the "warm cover" induced by Tibetan Plateau is about 600 hPa, which is 4 km. The mechanisms of the impact of "warm cover" in such altitude on PBL is needed to be illustrated in the manuscript.]

Reply: Many thanks for the referee's discussion. We agree with the suggestion. Following this comment, the content of Section 3.3 have adjusted (lines 168-173 and Figure 5) with following sentences:

"The concept of interdecadal variations of the tropospheric 'warm cover' has been proposed in this work. Under the background of climate change, it is worth considering whether the variational tendency of the structure of the plateau's heat source induces variations of the tropospheric thermal structure in downstream areas of the Plateau, leading to the interdecadal variations of the frequency of haze events seen in Eastern China since the 21th century. Thermal anomalies of the TP also play an important role in the variations of the frequency of haze events in EC apart from the anthropogenic pollutant emission related to the rapid industrialization of China. The observational and modeling studies have demonstrated that the interannual variations in the thermal forcing of TP are positively correlated with the incidences of wintertime haze over EC (Xu et al., 2016). The TP induced changes in atmospheric circulation, increasing atmospheric stability and driving frequent haze events in EC (Xu et al., 2016). In this study, the data analysis

concerning the interannual variations of the TP's apparent heat source and air temperature in wintertime at the TP with the altitudes above 3000 meters showed that since the 1960s the heat source in areas vulnerable to TP climate change strengthen continuously as the surface temperature increased (Fig. 5a). Furthermore, the TP's apparent heat and air temperature of the middle troposphere over EC presented the significant positive, which is similar to 'warm cover' structure characteristic (Fig. 5b). Therefore, we considered that the 'warm cover' change in the middle troposphere over EC was closely related to TP's apparent heat and the surface temperature. The TP induced changes in thermodynamic structure of atmospheric provided favorable climatic backgrounds driving air pollution events in EC."

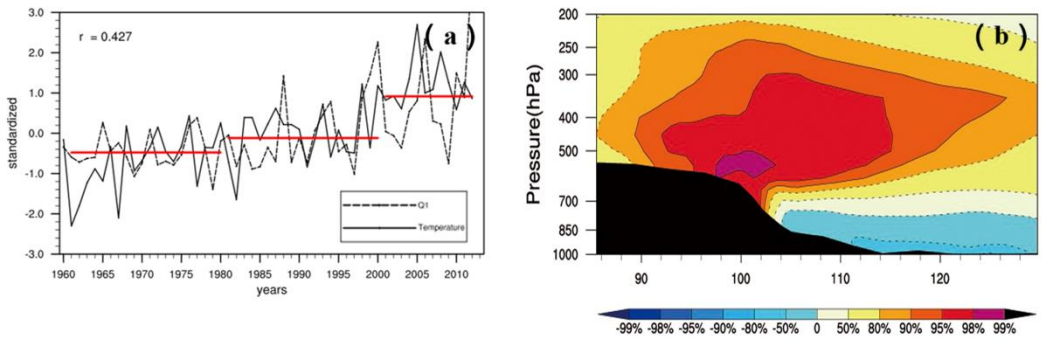

Figure 5. (a) TP's apparent heat source (Q1) and air temperature variations with interanual variations of TP's apparent heat source (Q_1) and air temperature of meteorological stations in the TP with the altitudes above 3000 meters in the winters during 1960-2014; (b) Vertical cross sections of the correlations between TP's apparent heat (Q_1) and air temperature latitude-averaged along 30-35 ℃N in the winters during 1960-2014.

We have accordingly cited the following article in the revised manuscript:

Xu, X. D., Zhao, T. L., Liu, F., Gong, S. L., Kristovich, D., Lu, C., Guo, Y., Cheng, X. H, Wang, Y. J., and Ding, G.: Climate modulation of the Tibetan Plateau on haze in China, Atmos. Chem. Phys., 16, 1365–1375, https://doi.org/10.5194/acp-16-1365-2016, 2016.