We thank the reviewer for the constructive criticism and suggestions that significantly improve the paper. Below, we go through them point by point, using normal font for original remarks *and blue italics for our replies*.

The manuscript endeavors to comprehend the field measurements of CO, N_2O & O_3 from the ASMA region during the StratoClim field campaigns and elucidate its different transport pathways. Quite a lot of quantification and new insights are offered in this manuscript. Hence the manuscript can be accepted for publication after addressing the following points.

Recommendation: Minor revision

Comments/suggetions

1. 3D Map of averaged CO from figure 2, looks nice but hard to get information easily. The Theta_e labels are not visible and difficult to understanding CO mixing ratios difference as they mentioned in the manuscript.

Figure 2 is completely refurbished, and the use of an incorrect color pallete in the displayed data is corrected (cf. reply to Michelle Santee's comment).

2. Many unconventional acronyms used in the manuscript, which make it difficult to read the manuscript, and some of them are not expanded where it first appeared. It will be better to minimize the same in running text.

We have carefully checked this and spell out acronyms the first time they are used in the revised manuscript.

3. Hope that AM Eq latitude in the figure 3 label is a typo instead of M Eq Lat. Or AsianMonsoon Equalent latitude is also a better terminology.

The use of AM EqLat in Figure 3 was unintentional and is corrected to MeqLat.

4. In case if not much required the supplementary materials can be limited in the manuscript. For eg Figure S4, which is not providing any new insights and besides which creating confusion with the discussion later in the text and main figures.

We prefer to keep all supplementary figures. They are in the supplement, because they are not strictly necessary to understand the paper or for the line of arguments. But they provide additional information that some may find interesting. For example, the rational for a PV based boundary of the ASM anticyclone and the derivation of MeqLat as a new coordinate was described by Ploeger et al. (2015) for the monsoon season in one particular year (2011), and the two analogous (to Fig 13 in Ploeger et al., 2015) plots for 2016 and 2017 shown in Figure S4 to give a better feeling for what the same analysis looks like in the StratoClim years when looking at the entire monsoon season. And it may help to understand why slightly different PV threshold numbers are being used for these years.

5. The statements in lines 245's are very difficult to digest from the figure and considering the possibilities of multiple other influencing factors.

We see the strong change of LRT altitude with latitude in the reanalysis data, consistent with the strongly changing difference between CPT and LRT at these latitudes seen in Figure S3 and with the strong PV gradient at 380 K seen in Figure 1. We add this information in the revised version.

6. Why there is a high value of CO even below 340K at designated latitudes (from figure 3 & 4). It will be nice if the authors can provide some details/explanations in this regard.

We are not sure what observation exactly this comment addresses.

In Kathmandu, tropospheric CO is consistently high (~100 ppb with some higher values especially at low altitude), which is expected and discussed. In Kalamata, tropospheric CO is generally lower, but some high values related to local pollution at Kathmandu airport show up at the lowest altitudes (especially in figure 2).

7. In the discussion section how suddenly authors restricted the transport till 370K. Till this point, the authors were mentioning that the LRT is at 380K. Better to clarify this.

We separate the terms "troposphere" and the potential temperature layers into two separate statements, which will hopefully clarify this. Also see our response to a similar comment by Michelle Santee.