

Interactive comment on “Chemical Isolation in the Asian monsoon anticyclone observed in Atmospheric Chemistry Experiment (ACE-FTS) data” by M. Park et al.

M. Park et al.

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We thank the reviewers for their helpful suggestions. Our response to the questions and specific suggestions are as follows:

Authors in this paper used the satellite observed ACE-FTS data to examine high concentrations of surface pollutants associated with the Asian summer Monsoon circulation in which vertically transported pollutants are trapped in the upper troposphere and the lower stratosphere. High concentrations of surface pollutants in the upper troposphere over Asia due to the Asian Monsoon were previously shown in the literature (e.g. Li et al., 2005) but they were limited by a lack of vertical profiles of chemical data

which were clearly displayed in this paper. The paper is well written and includes scientifically important analysis. It certainly deserves a publication in ACP although there are a few minor issues to be addressed. My comments on them are given as follows:

P5, "The initial comparisons of version 1.0" - this is unclear because the comparison is in good agreement with what? Please revise this sentence.

This is replaced by the v2.2 information in the revised version.

2) "Profiles depends (typo?)"

Fixed.

3) P6, The method to delineate the boundary of the monsoon region seems too arbitrary unless readers read the paper by Park et al. (2007). How robust the choice of 60 ppbv is to define the monsoon region (as discussed in section 4)? A physically based approach should be employed to define the monsoon region and is highly recommended for authors to consider.

The results shown in this paper is not sensitive to the threshold (60 ppbv) used in this study. As shown in Randel and Park (2006), the air inside the anticyclone is strongly correlated with low potential vorticity (PV). To make the definition of the anticyclone more clear, we added a scatter plot of CO with Ertel's potential vorticity calculated from the NCEP/NCAR reanalysis data in Figure 2 in the revised version. There is an overall correlation between CO and PV and high CO has relatively low PV (associated with the anticyclone).

4) P8, "In order to study."; Please revise this sentence which is now unclear.

Revised.

5) P9, The relative enhancement in concentrations inside decreases with lifetimes of species. However there is a slight increase from C₂H₆ to CO between 12.5 and 14.5 km in figure 6. Any explanation for this?

Given the vertical resolution of there data of ~ 3 km, we have chosen not to focus on such small details in the vertical structure.

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