

Interactive comment on “Climatological perspectives of air transport from atmospheric boundary layer to tropopause layer over Asian monsoon regions during boreal summer inferred from Lagrangian approach” by B. Chen et al.

Anonymous Referee #3

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This manuscript gives a detailed description of air transportation into the ASM tropopause layer from the boundary layer from a large amount of trajectory model running. These results will enhance our understanding of how the atmospheric species and pollution in the lower level is transported into the global stratosphere from the ASM region. I recommend the publication of this manuscript in ACP journal. However, I would like to provide some concerns in the following.

In the part of 2.2 Methodology, could you give more information, such as: (1) Is the FLEXPART model run forward, not backward? Regionally or globally? (2) How is the

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total atmospheric mass (7.0×10^{21} kg) estimated? (3) How to deal with the particles that come into the tropopause layer over ASM region but from PBL somewhere outside of ASM region? How to estimate their contribution? (4) And how deal with the particles that depart from PBL in the ASM region but come into the tropopause layer outside of the ASM region? (5) How are these 2.2 million particles distributed horizontally and vertically? Does each particle have the same mass? (6) Since FLEXPART model is Lagrangian one, how often do you start the initial particles, daily, weekly, or other? And how long do you trace these particles each turn? (7) Since NCEP/GFS has no vertical velocity above 100 hPa, how to deal with the vertical wind there? (8) How to count the TST-trajectories? Do you care the region where the trajectory enters the tropopause layer, in the ASM anticyclone, middle latitude, or even the tropics? (9) How to determine the PBL, especially in the plateau regions? (10) How to define the tropopause height?

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