

Interactive comment on “High tropospheric ozone in Lhasa within the Asian summer monsoon anticyclone 2013: influence of convective transport and stratospheric intrusions” by Dan Li et al.

Anonymous Referee #2

Received and published: 30 August 2018

This paper presents three cases of high ozone mixing ratios in the troposphere at Lhasa (29.66 N, 91.14 E) using Balloon-borne measurements. The ozone enhancement is linked to transport of polluted air from the boundary layer and downward transport from the stratosphere by intrusions. Results support with the simulation of Chemical Lagrangian Model of the Stratosphere and satellite measurements by OMI and AIRS. This paper shows important results of ozone variability over the Asian summer monsoon anticyclone region. I recommend publication after inclusion of following suggestions.

C1

- (1) The Introduction section is weak. The significance of the study is not well explained. A question addressed in the study should be in the interest of the larger community.
- (2) Does ozone increase during few epochs have implication on upper troposphere?
- (3) Present study show features from total column ozone. Ozone in the troposphere and stratosphere has different production and loss processes. During the monsoon season, lightning is one of the important agents for upper tropospheric ozone production. I suggest including a discussion on these aspects.
- (4) I suggest showing vertical ozone variations using satellite observations to show stratospheric/tropospheric intrusions. It may be evident in ozone anomalies.
- (5) Spatial plots of PV on potential temperature surfaces (360K or 380 K) will be useful to explain equatorward transport.
- (6) Vertical cross sections from CLaMS simulations indicating stratospheric contribution for the period 18–20 August 2013 will be useful.

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2018-652>, 2018.

C2