

Interactive comment on “A new transport mechanism of biomass burning from Indochina as identified by modeling studies” by C.-Y. Lin et al.

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Reviewer#1

We greatly appreciate the constructive comments and suggestions from this reviewer and, accordingly, have revised the paper. The detail response as following:

Specific comments:

1. A brief description of ozone formation related to biomass burning will help some readers who lack background knowledge regarding this topic.

R: We further the brief description of ozone formation related to biomass burning and citations in the article (Page 2, L18 ~ page 3 L4).

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2. Page 13162, lines 9-10: The upward warm advection on the eastern side of the lee side trough and ...” The upward motion will not cause a warm advection due to adiabatic cooling unless the environment late rate is greater than dry adiabatic. Same for the downward cold advection.

R: We re-write this paragraph in Page 11 L 6-9 as below: During the period between 8 and 11, April, the warm advection on the eastern side of the lee trough and the cold advection on the western side supported the up- and down-ward motions, respectively. Such synoptic-scale relationship can be realized through the omega equation under the quasi-geostrophic dynamics (Holton, 2004; Chapter 6)

3. Page 13163, Section 5: The authors showed the vertical profile for the simulated tracer over Northern Taiwan..... Therefore a horizontal cross section of the simulated tracer at 650 hPa, such as Figs. 4c and 4d, from the sensitivity study will enhance the conclusion.

R: Thank you very much for the reviewer’s suggestion. We have been added the horizontal distribution of the simulated tracer at 650 hPa for the sensitivity study (Figure 7d).

4. It will be useful if the accuracy of the fire frequency from MODIS data is provided.

R: We agree the reviewer’s suggestion. The MODIS data we used in this study is reliable. They are from the Collection4, MOD14 (MODIS Terra) with 1 km resolution and the data obtained from LP DAAC (Land Processes Distributed Active Archive Center) (<https://lpdaac.usgs.gov/>). (Page 6, L15-17)

Technical corrections:

1. For any acronym, it has to be defined when it is used for the first time.

R: Text has been amended in this revision (page 3, L13-15, Page 6, L2-3)

2. Page 13160: Which version of WRF/CHEM was used ? please specify.

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R: The WRF/Chem version is 3.0 in this study (Page 6, L3).

3. Figure 2, caption: add location information in the caption.

R: Text has been amended in this revision (Page 25, L8-9)

4. Figure 3: The quality of the figure (background map and station models) has to be improved. What exact field was plotted ?

R: The figure for this revision has been improved (Figure3) and caption also amended in this revision (page 25, L14).

5. Figure 4: caption: which level of information was plotted (650Pa) ? Add year information in the caption. “ The contour represents the wind speed...” should read “ The thick contour lines

R: Text has been amended in the caption (Page 25, L17 ; L19). We also reduce the number of wind vectors and increase the size of plotted wind vector in this revision (Figure 4).

6. Figure 5. Add the year information (2005?) into the caption. Line 4 was denoted by solid line. Should read “ ... was denoted by white solid line.” (g) “Simulation vertical distribution” , should read “ Simulated vertical distribution...”

R: Text has been amended in the caption (Page 26, L4-L15)

7. Figure 6: Again add year information into the caption:

R: Text has been amended in the caption (Page 26, L16-L18)

8. Figures 3, 5, and 6: It is difficult to read numbers in these figures on both x and y axes and legends. Need to use a larger font.

R: We have been improved the quality of those figures and the axes by using a larger font (Figures 3, 5, 7 and 9).

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