Dear Editor (Prof. Takamura):

Thank you so much for your letter and comments concerning our manuscript entitled "Modeling study on the transport of summer dust and anthropogenic aerosols over the Tibetan Plateau". Those comments are all valuable and very helpful for revising and improving our paper. We have studied the comments carefully and made some corrections. We hope the revised version is now acceptable for publication. Revised portion are marked in the document named "manuscript_make_up". The corrections for the paper and the point-by-point responses to your comments are as flowing:

Comments to the Author:
This is acceptable for publishing after confirming the following things with mi nor comments.

In Fig.5b of the first version, there was a heavy aerosol area around 40 deg. N. However, in the revised figure, it disappears. Even if you have re-simulated it with some tuned aerosol parameters, as described in your responses to the refe rees, this change looks so large. Other areas are not so changed even after your calculation.
In Figs.8a3 and 8b3, the similar phenomena are shown. Also in the revised fig ures, the color bar scale has been changed largely.
Are these rational and reasonable changes?
Response:

1. We have conducted sensitivity experiments with different parameter of dust emission (as shown in Fig. 1 and Fig. 2) and found a best parameter for the regional model (emfdu_du (4) = 6.5D-09) through comparing with satellite observation. With this tuned parameter, the distribution of the aerosol optical property is in agreement with the observed Aerosol Index from OMI (Fig. 1 a4) and the magnitude of dust mass concentration at surface is reasonable (Fig. 2 a3) according to the result in Takemura et al. (2002). As we adjusted the dust emission parameter only, the distribution of aerosol properties over the dust emission grids changes and the distribution over the grids without dust

emission has no variation. Although the wind fields are different slightly between the first version (Fig. 3) and the revised version (Fig. 4), it will not cause significant changes of the transported dust and the property of other aerosols. Furthermore, the comparison between the CALIPSO observation and simulation also show that the pattern in the revised version of the aerosol extinction coefficient (Fig. 6) is more reasonable than the result in last version (Fig. 5).

2. In addition, the color bar of Fig 3b in the first version was not setting well which missed some aerosol around 40 deg. N (see Fig1a2).

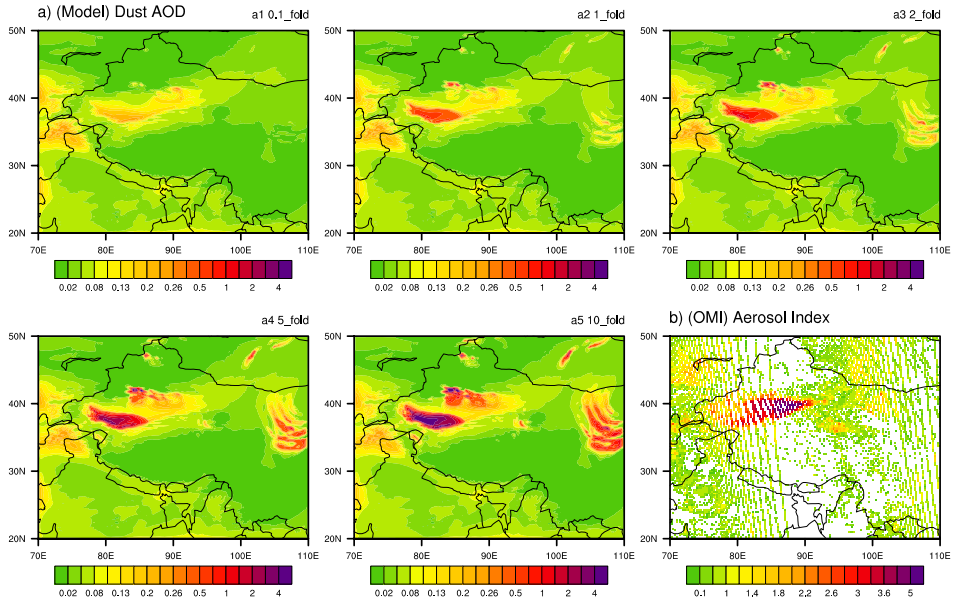

Fig. 1 Sensitivity experiments for dust AOD simulation on 22 August 2007.

a1: emfdu_du(4) = 1.3D-10 (0.1_fold)
a2: emfdu_du(4) = 1.3D-09 (value used in GCM)
a3: emfdu_du(4) = 2.6D-09 (2_fold)
a4: emfdu_du(4) = 6.5D-09 (5_fold)
a5: emfdu_du(4) = 1.3D-08 (10_fold)
a6: Aerosol Index from OMI

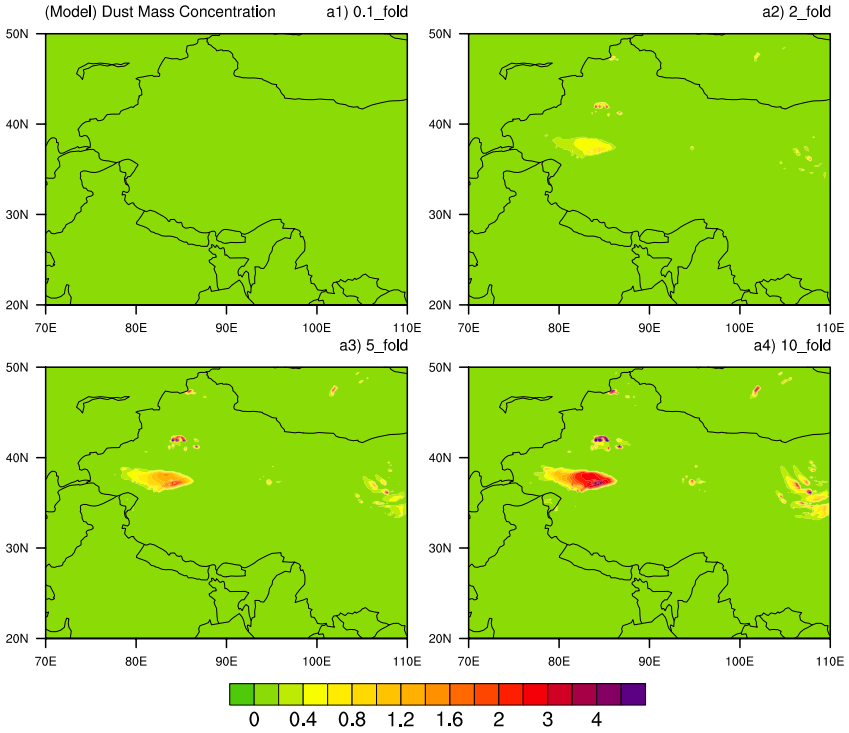

Fig. 2 Sensitivity experiments for simulation of dust mass concentration at surface (units: mg m^{-3}) on 22 August 2007.

a1: emfdu_du(4) = 1.3D-10 (0.1_fold)

a2: emfdu_du(4) = 2.6D-09 (2_fold)

a3: emfdu_du(4) = 6.5D-09 (5_fold)

a4: emfdu_du(4) = 1.3D-08 (10_fold)

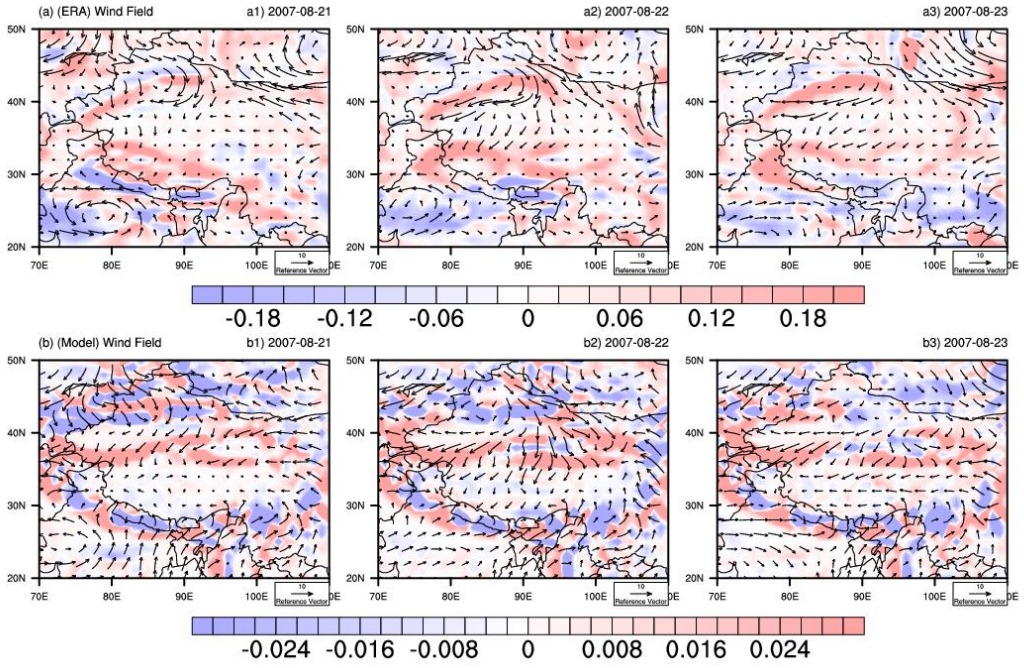

Figure 3. Wind field of the first version.

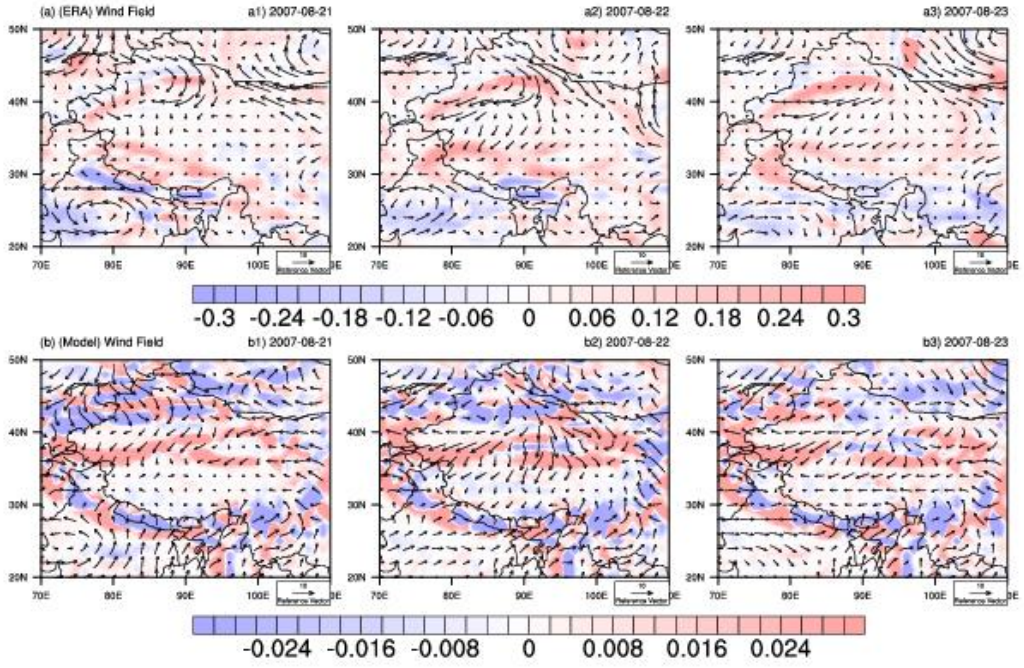

Figure 4. Wind field of the revised version.

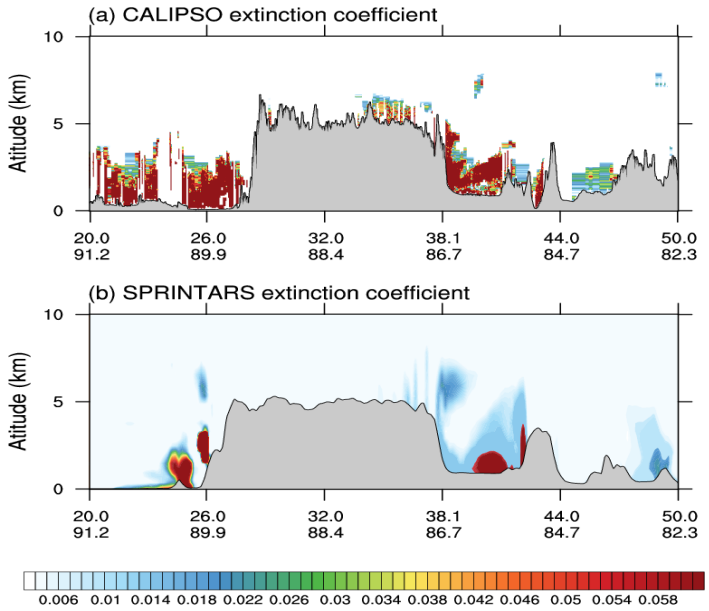

Figure 5. The vertical cross-section of the aerosol extinction coefficient (unit: km^{-1}) from **(a)** CALIPSO and **(b)** the simulation of the first version.

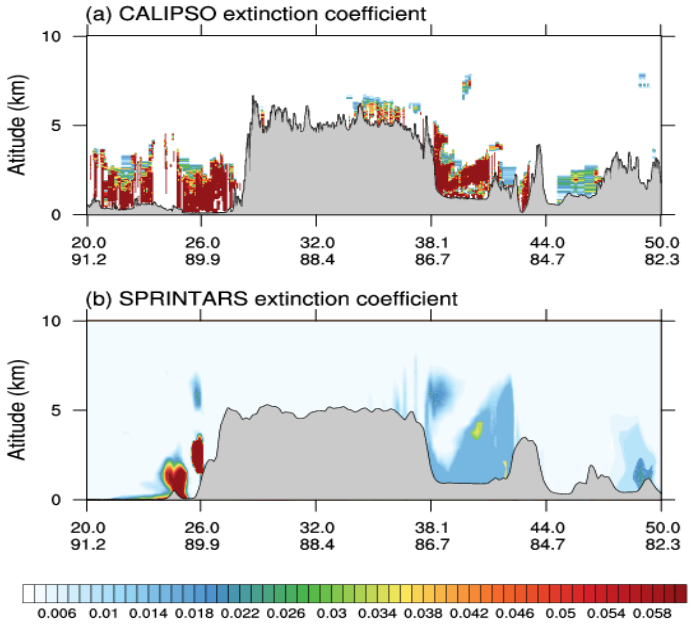

Figure 6. The vertical cross-section of the aerosol extinction coefficient (unit: km^{-1}) from **(a)** CALIPSO and **(b)** the simulation of the revised version.

Minor comments:(Mainly technical)

L56: ‘and Tegen, 1998, 2003’ ⇒ ‘and Tegen, 1998; Tegen, 2003)’

Response:

We have changed ‘and Tegen, 1998, 2003’ to ‘and Tegen, 1998; Tegen, 2003’ (line 56 in “manuscript_make_up”).

L107: ‘monthly aerosol optical depth(AOD)’ ⇒ ‘monthly mean aerosol optic al depth(AOD)’

Response:

We have changed ‘monthly aerosol optical depth (AOD)’ to ‘monthly mean aerosol optical depth (AOD)’ and the similar situations throughout the manuscript (line 107, 320 in “manuscript_make_up”).

L158: ‘ Lamarque et al.(2011) ’ ⇒ ‘ Lamarque et al.(2010) ’

Response:

We have changed ‘Lamarque et al. (2011)’ to ‘Lamarque et al. (2010)’ (line 158 in “manuscript_make_up”).

L167: ‘particle sizes of dust, … is divided into’ ⇒ ‘particle sizes of dust, … are divided into ’

Response:

We have changed ‘particle sizes of dust, … is divided into’ to ‘particle sizes of dust, … are divided into’ (line 167 in “manuscript_make_up”).

L283: ‘ the column-integrated aerosol’ ⇒ ‘the column-mean aerosol’ ???

Response:

We are appreciated for your comments and sorry for such a simple mistake. We have checked the script carefully and found that ‘ the column-

integrated aerosol' should be changed to 'the surface aerosol' (line 283 in "manuscript_make_up").

L284: ' Angstrom exponent ' ⇒ ' Ångstrom exponent '
Also L767 in Figure caption

Response:

We have changed 'Angstrom exponent' to 'Ångstrom exponent' (line 284, 767 and 858 in "manuscript_make_up").

L285: ' The black rectangles ' ⇒ ' The three black rectangles '

Response:

We have changed 'The black rectangles' to 'The three black rectangles' (line 285 in "manuscript_make_up").

L288: ' because of ' ⇒ ' causing ' ???

Response:

Thanks for your kind advice. But we think that the SSA values are thw manifestation of the strong absorption instead of the cause of generation. So we think that 'because of' should not be changed to 'causing'.

L299: 'Additionally, east of the TP, the sulfate aerosols' ⇒ 'Additionally, o ver the east of the TP, the sulfate aerosols ' '

Response:

We have changed 'Additionally, east of the TP, the sulfate aerosols' to 'Additionally, over the east of the TP, the sulfate aerosols' and the similar situations throughout the manuscript (line 299, 346, 426 in "manuscript_make_up").

L319: ' monthly aerosol optical ' ⇒ ' monthly mean aerosol optical '

Response:

We have changed 'monthly aerosol optical' to 'monthly mean aerosol optical' and the similar situations throughout the manuscript (line 207, 319 in "manuscript_make_up").

L321-322: ' Figure 6a and b ' ⇒ ' Figures 6a and 6b '

Response:

We have changed 'Figure 6a and b' to 'Figures 6a and 6b' (line 322 in "manuscript_make_up").

L325: ' between Fig. 6c and d ' ⇒ ' between Figs. 6c and 6d'

Response:

We have changed 'between Fig. 6c and d' to 'between Figs. 6c and 6d' (line 325 in "manuscript_make_up").

L372: 'Additionally, Fig.7 shows' ⇒ ' Additionally, Figure 7 shows '

Response:

We have changed 'Additionally, Fig.7 shows' to 'Additionally, Figure 7 shows' (line 372 in "manuscript_make_up").

L387: 'SSA in Fig. 4a2 and a3. As suggested in Fig. 8a1 and b1' ⇒ 'SSA in Figs. 4a2 and 4a3. As suggested in Figs. 8a1 and 8b1 '

Response:

We have changed 'SSA in Fig. 4a2 and a3. As suggested in Fig. 8a1 and b1' to 'SSA in Figs. 4a2 and 4a3. As suggested in Figs. 8a1 and 8b1' (line 387 in "manuscript_make_up").

L396: ' a large updraft existed ' ⇒ ' both updrafts existed'

Response:

We have changed 'a large updraft existed' to 'both updrafts existed' (line 396 in "manuscript_make_up").

L397: ‘The aerosol mass concentration’ ⇒ ‘ The dust mass concentration ’

Response:

We have changed ‘The aerosol mass concentration’ to ‘The dust mass concentration’ (line 397 in “manuscript_make_up”).

L425: ‘high values east of the TP’ ⇒ ‘high values over the east of the TP’

Response:

We have changed ‘high values east of the TP’ to ‘high values over the east of the TP’ (line 426 in “manuscript_make_up”).

Special thanks to you for your good comments.

We have checked the manuscript and revised it according to the comments. We submit here the revised manuscript and hope that the revised version of the paper is now acceptable for publication.

If you have any question about this paper, please don't hesitate to contact me at the address below.
Thank you and best regards.
Sincerely yours,
Yuzhi Liu

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