This manuscript simulated the dust emission, transport, and relevant radiative forcing from two dust source regions in China using an integrated WRF-Chem model and compared the model simulation to observations. The contributions to dust emission of Taklimakan desert and Gobi desert as well as the difference during two adjacent time periods were analyzed. The significant contribution of Gobi desert to East Asian indicated in this manuscript should be concerned in future dust study over East Asia. I suggest to accept for publication after considering following comments.

1) The author mentioned the difference between simulated wind speed and in situ observations. How will this difference influent the simulation of dust emission and transport? Add analysis on this difference to the simulated dust emission and transport in discussion. Meanwhile, as the WRF-Chem simulation used NCEP/FNL reanalysis data for obs-nudging, why used averaged winds and temperature from NCEP/FNL to evaluate the performance of model?
2) Please specify the reason to choose this dust storm. Introduce some backgrounds.
3) Line 48, provide quantitive index to support 'GD dust transport was the primary contributor'.
4) Line 53, provide average GD dust emission flux compared to that from TD to emphasize the the difference of transport contribution.
5) Lines 57-8, what's the percentage of the "a small amount"? What is the 'greater distances' compared to?
6) Lines 182-3, is the grid square grid with 36km*36km?
7) Lines 263-4, add simulated and observed wind speeds.
8) Lines 304-5 and 314-5, which AOD is considered over TD? It seems both Mt_WLG and SACOL are more close to GD.
9) Lines 333-4, delete "because of the changes in the radiative balance".
10) Introduced Fig 7 & 8 before Fig 6. Re-order it. Also add explain on Fig. 6 in text.
11) Line 375, 'the through' should be 'the trough'.
12) Line 404, delete 'due to the complex terrain and the prevailing wind,'.
13) Lines 419-22, this sentence is confusing.
14) Lines 449-50, what to support "the dust transport from the GD was the dominant factor contributing positively to TD dust mass concentration"?
15) Lines 452-3, "between 250 K-270 K" is not shown in Fig.13. Plot 250 K isentropic line if possible.
16) Line 476, provide the order of LW radiative forcing of dust which is not shown in Fig. 14.
17) Lines 494-5, the negative LW radiative forcing dues to the back scattering from dust to surface.
18) Fig. 1, the color of topography makes the station names hard to find. Greyscale can be used to simplify it.
19) Fig. 2, the unit of temperature should be in Celsius.
20) Fig. 4, re-arrange the stations based on the distance to source or other criteria. The color of dots is not correct in the legend.
21) Fig. 6, the figures are plotted to 1000 hpa, while at some place this pressure should be lower than the local topography. Consider add local topography with black shadow. It should be meridional mean, not zonal mean.
22) Fig. 7 and Fig. 8, consider to remove some lines and line notions to make these figures more pithy.
23) Fig. 9, add descriptions on the arrows. The meridional circulation should be related to three-cell pattern.
24) Fig. 11, consider change the unit of temperature from Fahrenheit to Celsius or Kelvin.

25) Fig. 12, re-arrange the colors in same relative positions. It looks strange to find some blue bars are left of red while some others are opposite.
26) Fig. 13, add description for the black lines.
27) Fig. 15, is the heating rate due to dust daily-mean during the simulation period?
28) The grammar and writing can be improved, e.g. a lot of unnecessary “the” in the manuscript. Sentence like ‘The effects of the TD dust were felt not only locally’ in lines 545-7 can be changed to “The effects of TD dust were not only local but worked on regions far from the sources as well”.