

Interactive comment on “Emission, transport and radiative effects of mineral dust from Taklimakan and Gobi Deserts: comparison of measurements and model results” by Siyu Chen et al.

Anonymous Referee #1

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This manuscript presented the WRF-CHEM modeling results of Emission, transport and radiative effects of mineral dust from Taklimakan and Gobi Deserts based on the validation with the measurements of CALIPSO Aerosol Extinction Coefficients and AERONET-AOD as well as the available meteorological observation. It is especially interesting to compare the differences in regional dust transport from two major deserts in Taklimakan and Gobi regions for understanding on Asian dust aerosols and their climate effect. Therefore this manuscript could fall within the scope of ACP. I suggest the major revisions before it is published as follows:

1) Please give more discussions on the effect of basin terrain on dust emissions and transport over the Taklimakan Deserts, where the simulated dust emissions are over-

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estimated due to the larger near-surface winds (Lines: 265-267: The simulated wind speed (6.4 m s^{-1}) was higher than the observed wind speed (4.7 m s^{-1})). How are the influences of the overestimated dust emissions and the unique boundary layer in the basin atmosphere on TD dust transport?

2) Please improve the quality of figures and clarify the captions: a) Fig. 1: the color bars around 2000m and higher than 5800m are almost same. b) Fig 3: the number size is too small to be seen. c) Fig 5: are any similar plots over the Gobi Deserts? c) Fig 11: the meanings of solid and dash lines? d) Fig 12: Please clarify the estimations of dust mass balance and transport. Should be the negative and positive values equal? e) Fig. 13: what do the dash lines stand for?

3) Please check the English grammar (for example: line 328: plays a very important role)

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