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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Taklimakan dust aerosol radiative heating derived from CALIPSO observations using the Fu-Liou radiation model with CERES constraints" *by* J. Huang et al.

J. Huang et al.

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We are very appreciative of the reviewer's thorough review of the paper. The suggestion is very helpful in improving the paper. The revised version has made corresponding changes according to reviewer's comments. The following are our responses to the reviewer's comments:

1. The extinction coefficient used in this work is from lidar single wavelength. The authors must clearly show how this extinction coefficient is applied to other wavelengths in the Fu-Liou model. Since extinction is wavelength-dependent, the authors must Justify their treatment on this aspect.

Response: The wavelength dependence of the extinction coefficients follows the de-

pendence of those based the dust transported mode. The extinction coefficients at 532nm from CALIPSO measurements were used to derive the number of aerosols using the extinction cross sections at 532 nm from the dust transported mode. We have clarified this in the revised paper.

2. In Introduction, how do physical properties and chemical composition of aerosols exert cooling or warming effect on climate? To this reviewer, the optical properties (determined by physical properties and chemical composition) are enough for these effects.

Response: We agree with the reviewer that the aerosol optical properties are determined by physical properties and chemical composition. To avoid the reader confusion, we removed this sentence and related citation.

3.In Introduction, the authors list imaginary part of the refractive index as a variable to affect the net radiative effect. How about the real part of the refractive index? No effect?

Response: The real part of the refractive index also affects the net radiative effect. To avoid the reader confusion, we have removed “the imaginary part” and related citation.

4. In Introduction, the authors should consider to remove some unnecessary citations and only cite the most representative references.

Response: We have removed some unnecessary 14 citations as the reviewer suggested.

5. The authors should consider if Fig1 and relative text are necessary.

Response: We removed Figure 1 as suggested.

6. The authors should consider moving the 1st paragraph of text in Section 7 to the Introduction part and remove the 3rd and 4th paragraphs.

ACPD

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Interactive Comment

Response: We moved the 1st paragraph of the text in Section 7 to the Introduction and removed the 3rd and part of 4th paragraphs, as suggested.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 5967, 2009.

ACPD

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Interactive Comment