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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Estimation of Asian dust aerosol effect on cloud radiation forcingusing Fu-Liou radiative model and CERES measurements" *by* J. Su et al.

J. Su et al.

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Reviewer #2

We are very appreciative of the reviewer’s thorough review of the paper. The comments are very helpful in improving the paper. The revision has been made to account for the reviewers’ comments. The following are our responses to the reviewer’s comments:

Question 1: How can the authors make sure the clouds for CLD and COD regions are same, assuming no dust event. In other words, how do the authors confirm the subtle difference in CRF is not caused by the clouds themself.

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Response: Actually, the COD (cloud over dust) and CLD (dust-free cloud) cases constitute a pair. Each COD case has a corresponding CLD case in close geographical proximity. Once we choose a COD case, we find a corresponding CLD case in as close a region as possible that has similar cloud and meteorological conditions to minimize the their effect on the comparisons. All 16 COD cases have corresponding CLD cases. We have added a similar statement in our revised version.

To confirm that the subtle differences in CRF are not caused by the clouds themselves, we compare the CRF in the CLD and COD regions as a function of solar zenith angle (see Fig. 2) and cloud properties, such cloud top temperature, optical depth (see Fig. 3), particle size, and cloud water path.

Question 2: The dust event case numbers are statistically too low. It is better to compare CLD and COD CRF for the same place but for a long time series.

Response: We think it is a good suggestion, but CERES SSF data are available for only 4 years and it is difficult to find many pairs of COD and CLD due to the limited number of dust events during the 4-year period. In addition, although the number of cases is not large, the number of cloud pixels is large enough to be statistically significant.

Question3: The authors should make the conclusion section concise and relevant to the main Interactive comment on Atmos. Chem. Phys. Discuss., 8, 2061, 2008.

Response: In the revised version, the conclusion section has been condensed and should now be more relevant to the main Interactive comment.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 2061, 2008.