**Atmospheric
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Discussions**

Interactive comment on "Uncertainty analysis for estimates of the first indirect aerosol effect" by Y. Chen and J. E. Penner

Y. Chen and J. E. Penner

We thank anonymous referee #2 for useful comments. We will incorporate corrections and supplements in the revised version.

As for specific comments:

1. We have tried several dispersion formulations and will also examine that in Rostayn and Liu(2003) in the revised manuscript.

2. The reviewer is correct in stating that there should be a link between TKE and the velocity standard deviation. Nevertheless, it is not clear that the current relations are accurate (Guo et al., 2004). Hence we used observed PDFs for our base case.

3. The assumption of the independence of these variables has already been noted

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in the paper. We are in the process of calculating the effect of the covariance of the variables on uncertainty now and hope to include this, where possible, in the revised version of the paper. A method of estimating pre-industrial BC will be added in the revised version.

4. 'which is only about 10%' has been changed to 'which is 2.2 ˜ 2.7 W/m2'.

5. All 'k's' have been changed to 'b'.

6. '2/3 confidence' means 'the 67% confidence interval'. This confidence interval corresponds to the critical value of t=1 for a two-tailed t test. This has been modified in the revised version of the manuscript.

7. The word 'humidity' has been added.

Reference: Guo, H., J. E. Penner, M. Herzog and X. Liu, Comparison of the vertical velocity used to calculate and cloud droplet number concentrations in a cloud-resolving model and a global climate model, Fourteenth ARM science team meeting proceedings, Albuquerque, New Mexico, March, 2004

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