**Atmospheric
Chemistry
and Physics
Discussions**

Interactive
Comment

Interactive comment on "Dust aerosol radiative effect and influence on urban atmospheric boundary layer" by L. Zhang et al.
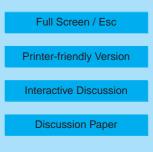
L. Zhang et al.

Received and published: 1 February 2008

Thank you so much for your valuable comments that are very helpful in improving the paper. As follows are our replies.

1. Q: Title is probably changed to ?Dust aerosol radiative effect and its influence on urban atmospheric boundary layer?. Or, the authors can find a better way to describe their work in the title. A: Your comment is better to describe the work, so the title can be changed to 'Dust aerosol radiative effect and its influence on urban atmospheric boundary layer'.

2. Q: Page 1, Abstract, line 3. Full name for AML. A: The lidar used here is made in Atmospheric Optics Laboratory, Anhui Institute of Optics and Fine Mechanics, the Chinese Academy of Sciences. It is a mobile lidar and AML-1 shows its type.

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3. Q: Page 1, Abstract, line 5, ?heats up? should be ?heat?. A: Thank you very much. According to your comment, we have revised this word.

4. Q: Page 3, Equation (1), left term, Iv(tau, mu, phi). A: According to your request, we have changed for , and also changed for .

5. Q: Page 4, Equation (2), left term, tau(z). A: The authors are grateful to your careful reading. has been changed to .

6. Q: Page 4, what atmospheric profiles were used for calculating radiation flux? A: The meteorological field simulated by ABL model is used to calculate the radiation flux. 7. Q: Page 4, Equation (5). What is Cp, g, and rho? A: Sorry for the lack of variable explanations. Thank you very much for your helpful comment. Supplementary explanations have been added to the paper.

8. Q: Page 4, third paragraph. Add some introduction on the ABL model since the model is one basis for investigating the dust aerosol radiative effect. A: This paragraph introduces the character of ABL model, and the grid design is explained in the fourth paragraph on Page 5.

9. Q: Page 5, first paragraph. What are the atmospheric profiles for? Probably this part can be move to another suitable place. A: This paragraph is to verify the model, and it has now been transferred to the fifth paragraph.

10. Q: Page 7, first paragraph. It is better to add more information on involving heating rates into the ABL model. A: The heating ratio is put into the ABL model by a ground surface energy budget equation，more explanations have been added to the fifth paragraph on Page 4.

11. Q: Page 8, reference. Li Xingsheng et al., and the last five references. Using the universal style for ACP. A: Thank you very much. According to the ACP requirement, we have revised the reference.

12. Q: Figure 1. Typo in tickname of x-axis. Minute. A: Thanks for your carefulness,

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we have revised this word.

13. Q: Figure 2. Tickname of x-axis, add unit of 1/km. A: Thank you very much. The unit has been added to.

14. Q: Figure 3. The figures show profiles of temperature and horizontal velocity. So suggest to changing the caption to, ?Profiles of temperature and horizontal velocity from simulations with aerosol and without aerosol, respectively, at?? A: Thanks for your helpful comment, according to your suggestion, we have changed the caption of figure 3 to ‘Profiles of temperature and horizontal velocity from simulations with aerosol and without aerosol, respectively, at 14:00LT, Jan. 24, 2002.’.

15. Q: Figure 4. Same as the comment in 14. A: We have also amended the caption of figure 4 to ‘Profiles of temperature and horizontal velocity from simulations with aerosol and without aerosol, respectively, at 02:00LT, Jan. 24, 2002.’.

The related contents have been marked in the paper by the red color typeface.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 15565, 2007.