

## ***Interactive comment on “A case study of dust aerosol radiative properties over Lanzhou, China” by L. Zhang et al.***

### **Anonymous Referee #4**

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The authors analysed the dust aerosol and its radiative properties using the different measurements at an international research observatory based in the Semi-Arid Climate and Environment Observatory of Lanzhou University. These observations are very important and should be very useful for the scientific community to better understanding the aerosol effects on the local climate and other related environment issues. The manuscript should be published in ACP after some revision.

- 1) The authors should give some background for the dust storm event occurred in Lanzhou from 27 to 29 March 2007. What is the meteorological condition (ie. large scale weather system) for this event?
- 2) The parameter of lidar ratio (LR) is very important for the lidar retrieval. How sensitivity of it at the Semi-Arid Climate and Environment Observatory of Lanzhou University

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(SACOL) site? Although the authors mentioned that "there are some previous studies about the LR in Lanzhou (Xia, 2006; Han, 2007)" but it is still not clear why choose the value of 25sr for LR in Lanzhou.

3) It will be better to estimate the uncertainties for dust aerosol extinction coefficient, AOD. ie. adding error bars in vertical profiles of dust aerosol extinction coefficient, AOD in Figure 4,5 and 6.

4) Please be careful to use the word of "identical". When compare the aerosol scattering coefficient and PM10 concentration in Figure 7, there is still some different trends between them.

5) The correlation among dust aerosol extinction coefficient, scattering coefficient and PM 10 concentration is high at 450 nm, what is the correlation coefficient for 520nm, 700 nm? Please make it clear in the abstract, section 4.6 and conclusion.

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Interactive comment on Atmos. Chem. Phys. Discuss., 10, 2889, 2010.

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