

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

Anonymous Referee #1

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General Comment:

Aerosol affects the Earth and atmospheric radiation, also influence the temperature and cloud formation. Dust aerosol optical depth (AOD), one of the important parameter in dust storm quantitative study, can be used to calculate dust concentration and dust flux in sand storm by satellite remote. However, it is very difficult to get true values of AOD, dust concentration and dust flux because of the limitation of observational data. In this paper, the temporal and spatial distribution of AOD was calculated using the data obtained by micropulse Lidar and sunphotometer, respectively. The radiative effect of dust aerosol was analyzed with aerosol scattering coefficient, extinction coefficient, PM₁₀ concentration. The results will help us to understand the variation of aerosol radiative properties during dust storms. The data are very important. Although

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some parts of the descriptive contents of the manuscript are not well written, the important information is clear. I think the work performed by the authors is useful and I recommend publication after some revisions prior.

Specific points: 1 Page 6, line 14-25: it is better to show the results of aerosol LR by table list. 2 Page 7, line 6-10: it is useful for the characteristics of wind speed, temperature and humidity by routine meteorological data. Please give more detail, if possible. 3 Page 9, Line 1-10: Please add more description for the AOD obtained by sunphotometer. 4 Figure 5 and Figure 7, it is different for the peak value of AOD and PM₁₀ concentration. i.e. the peak value of AOD at 12:00 March 28 and PM₁₀ is at 22:00 March 27. Please give the possible reason.

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