

Interactive comment on “Dust aerosol effect on semi-arid climate over Northwest China detected from A-Train satellite measurements” by J. Huang et al.

Anonymous Referee #1

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Review of “Dust aerosol effect on semi-arid climate over Northwest China detected from A-Train satellite measurements” by Huang et al.

Recommendation: Accepted with stated minor revision

General Comments:

The major contribution of this paper is to study the impact of dust aerosols on the semi-arid climate of Northwest China by comparing aerosol and cloud properties over semi-arid regions between China and United States, using surface and A-Train satellite observations during active dust event seasons. They found that the local anthropogenic dust aerosols due to human activity, such as agriculture and industrial activity,

C3909

accounts for 44% of the average absorbing aerosol index and for 77% of the liquid cloud water path difference between the China and US semi-arid regions. It suggests that the local anthropogenic absorbing aerosols also make some contribution to the regional interaction among aerosol-cloud-radiation-precipitation processes and need to be further investigated. In general, I found that the paper is well written and is appropriate for ACP readers. I recommend the paper for publication with addressing the minor comments listed below.

Specific Comments: 1. Page 12466, line 23: ‘occured’ → ‘occurred’,

2. Page 12467, line 3: “changes in the climate” → “climate changes”,

3. Page 12467, line 6: “large quantities” → “large amount”,

4. Page 12467, line7: Author should explain whether the FD and BD have the similar visibility less than 10 km.

5. Page 12467, line 6: “High winds” → “strong winds”,

6. Page 12468, line 19: Among the string ‘Clouds and Clouds and Earth’s Radiant Energy Experiment (CERES)’, the first ‘Clouds and ’ should be deleted.

7. Page 12471, line 7: “The thickness of the saturated layer ”should be explained in the text as its first appearance.

8. Page 12472, line 4: “The climate type” → “the type of climate”,

9. Page 12472, line 10: “the northwestern” → “northwestern”,

10. Page 12473, line 2: “the meteorological” → “meteorological”,

11. Page 12476, line 25: ‘from late spring and the later summer’ should be replace as ‘during the late spring and the late summer’

12. Page 12488, Fig. 4: Author should explain whether Fig.4 is for the spring only or for the whole year.

C3910

13. Page 12476, line 2: "the meteorological" → "meteorological"
14. Page 12476, line 4-6: How can the mean RH be 25.3% when there are so many thick saturated layers with RH>85%?
15. Page 12476, line13: Author should explain how is the "saturated layers" defined exactly.
16. Page 12478, line 2: "the evaporation" "evaporation",
17. Page 12479, line 2: "aerosol" → "aerosols"
18. Page 12479, line 7: "Jing Su et al." → "Su et al.",
19. Page 12479, line 13: The sentence reads not correct. I would suggest to change it to "The results presented in this paper are based on satellite observations, which further confirm the semi-direct effect of Asian dust,"
20. Page 12482, line 4: '51 (23) 2913–2925, 2006' should be replace as '51 (23), 2913–2925, 2006'
21. Page 12483, line 13: 'D,' should be deleted.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 12465, 2010.