

General comments:

Dust aerosol in remote Taklimakan Desert and Gobi deserts of northwest China is thought to be hardly affected by human activities, due to sparsely population. The authors conducted a comprehensive field measurement in a Gobi farmland region of northwest China, and demonstrated a potential anthropogenic influence on dust physicochemical properties using multiple ground-based active and passive sensors. The agricultural operations and biomass burning from crop residue prior to growing season were well documented to produce significant impacts on elevated dust loadings and absorption characteristics in Dunhuang farmland during spring of 2012. The findings of this study are very interesting and would help to improve our understanding of the interaction among dust aerosol, atmospheric chemistry, and climate change in desert source region. And I suggest that the authors should carry out long-term and continuous measurements of mineral dust at remote Gobi deserts in northwest China, to quantify the potential anthropogenic contributions on regional climatic and environmental changes. I think the English writing is fine, and I recommend this manuscript is appropriate for publishing after minor revision.

Minor comments:

1. **Abstract**, Page 1, line 27: “In the afternoon (13:00–18:00 LT)”
⇒ Change to “In the afternoon (13:00–18:00 LT, local time)”. When an abbreviation firstly appears in the manuscript, please give the full name.
2. Page 3, line 78: “(i.e., hematite and goethite)”
⇒ Change to “(i.e. hematite and goethite)”
3. Page 4, line 90: “(i.e., Mongolia Gobi desert)”
⇒ Change to “(i.e. Inner Mongolian Gobi desert)”
4. Page 4, line 111: “close to the east edge of Kumtag Desert”

⇒ Change to “close to the eastern edge of Kumtag Desert”

5. Page 5, line 130: “to the southeast”

⇒ Change to “to the southwest”

6. Page 6, line 154: “High AI values (>0.7) distributions”

⇒ Change to “The distributions of high AI values (>0.7)”

7. Page 9, line 265: “(i.e., Mongolia cyclones)”

⇒ Change to “(i.e. Mongolian cyclone)”

8. Page 12, line 331: “2 to 4 km”

⇒ Change to “4 km”

9. Page 12, line 332: “which was within the planetary boundary layer (PBL)”

⇒ Change to “which was above the planetary boundary layer (PBL)”

10. Page 14, line 402: “Likewise”

⇒ Change to “Similarly”

11. Page 19, line 563: “atmospheric boundary layer structure”

⇒ Change to “the structure of atmospheric boundary layer”

12. Page 20, line 575: “lager”

⇒ Change to “larger”

13. Page 21, line 614: “The findings of this study directly demonstrated mineral dust”

⇒ Change to “The findings of this study directly demonstrated that mineral dust”