

Manuscript No.: **acp-2016-764**

Journal: **ACP**

The revised manuscript entitled "**Comparison of key absorption and optical properties between pure and transported anthropogenic dust over East and Central Asia.**" by Jianrong Bi, et al.

Response to Reviewer#1:

We greatly appreciated for Editor's big help! We have carefully checked and revised the manuscript according to Reviewers' comments, which are helpful and valuable for greatly improving our manuscript. Please find a point-by-point reply to the issues as follows (highlighted in blue color font). And we have also uploaded the file of "Response to-Reviewer#1(acp-2016-764).pdf".

Suggestion:

1. How to distinguish and separate the natural and anthropogenic contributions for climate variability, has become one of the most intractable problems in current global climate change. The authors proposed two threshold criteria to identify two types of Asian dust: Pure Dust (PDU, $\alpha < 0.2$) and Transported Anthropogenic Dust (TDU, $0.2 < \alpha < 0.6$), and explore the key absorption and optical properties. These results are encouraging and helpful to update the essential parameters of Asian dust in current remote sensing applications and climate models. As mentioned in the manuscript, it is still a huge challenge to discriminate between natural and anthropogenic components of dust aerosols by using current technology, AERONET products or in-situ measurements. However, the reviewer encourages the authors to explore detailed morphology, mineralogy, and chemical compositions by means of in situ measurements, laboratory analysis, active and passive remote sensing methods (e.g., multi-wavelength lidar, AEROENT, MODIS) as well as model calculations in the future work.

⇒ The authors don't need to response this.

Response: Thank you very much for Reviewer's good suggestions. To fully elucidate

exact optical properties of anthropogenic dust, we shall explore detailed morphology, mineralogy, and chemical compositions by means of in situ measurements, laboratory analysis, active and passive remote sensing methods (e.g., multi-wavelength lidar, AEROENT, MODIS) as well as model calculations in our future work.

Minor comments:

1. **Abstract**, Page 2, line 54: “OPAC”

⇒ Change to “Optical Properties of Aerosols and Clouds (OPAC)”. When an abbreviation firstly appears in the manuscript, please give the full name.

Response: We have changed “OPAC” to “Optical Properties of Aerosols and Clouds (OPAC)” in Line 54 and corresponding places in the whole text.

2. Page 3, line 80: “are about 6 times larger than at 660 nm”

⇒ Change to “are about 6 times larger than that at 660 nm”

Response: We have changed to “are about 6 times larger than that at 660 nm” in Line 80.

3. Page 4, line 114: “theory calculation”

⇒ Change to “theoretical calculation”

Response: We have changed “theory calculation” to “theoretical calculation” in Line 114.

4. Page 8, line 209: “compared to”

⇒ Change to “compared with”

Response: We have changed “compared to” to “compared with” in Line 209.

5. Page 8, line 219: “literatures”

⇒ Change to “literature”

Response: We have changed “literatures” to “literature” in Line 219.

6. Page 9, line 247: “linked to”

⇒ Change to “linked with”

Response: We have changed “linked to” to “linked with” in Line 247.

7. Page 17, line 494: “PUD”

⇒ Change to “PDU”

Response: We have changed “PUD” to “PDU” in Line 494.