Comments on "Comparison of key absorption and optical properties between pure and transported anthropogenic dust over East and Central Asia." by Jianrong Bi et al.

General comments:

Asian mineral dust is one of the most important aerosol species in the Earth-atmosphere system that exerts profound influences on air quality, public health, marine biogeochemical cycle and Earth's climate. However, the absorptive ability of Asian dust is still an unresolved question at present, causing large uncertainties in estimating its shortwave radiative effect in current regional models. This study compiles the key absorption and optical properties between pure dust (PDU) and transported anthropogenic dust (TDU) over East and Central Asia, by utilizing multiyear and multi-site quality assured AERONET measurements. The authors also compare the average spectral behaviors of PDU with present-day common dust models (e.g., OPAC and WMO) together with published results over various desert locations. These meaningful results are very useful to evaluate quantitatively the radiative effects of Asian dust on regional or global climate change. In general, I found the paper is well written in English, and I recommend accepted this paper for publication in the journal of Atmospheric Chemistry and Physics with minor revision.

Specific comments:

(1) Page 16, lines 471-473: "The main input parameters of spectral AOD, surface albedo, WVC, and columnar ozone amount are prescribed to same values (e.g., …)"

⇒Please give the prescribed values of spectral AOD, surface albedo, WVC, and columnar ozone amount in the manuscript, which would be convenient for audience.

(2) Page 33, Figure 5(b): For Minqin and Dunhuang sites, the AOD_{440} and r_{coarse} are shown for "-", the authors may want to indicate the missing data. Please give the

explanation in the context.

Minor comments:

(1) 1. Introduction, Page 5, line 142: Please add "There have been several world-famous aerosol long-term monitoring networks over Asian region for examining aerosol features and its radiative effects, for instance, AERONET—AErosol RObotic NETwork (Holben et al., 1998), SKYNET—aerosol-cloud-radiation interaction ground-based observation network (Nakajima et al., 1996; Takamura et al., 2004; Che et al., 2008), and CARSNET—China Aerosol Remote Sensing Network (Che et al., 2009, 2014, 2015)." at the beginning of this section and add corresponding cited literature in

(2) Page 7, line 200: "**3. Asian Dust Optical properties**"

⇒ Change to "**3. Asian Dust Optical Properties**"

(3) Page 7, lines 201-205: Change to "A great amount of publications have verified that mineral dust aerosols are commonly predominant by large particles with coarse mode (radii>0.6 μm), which are the essential feature differentiating the dust from fine-mode dominated biomass burning and urban-industrial aerosols (Dubovik et al., 2002b; Eck et al., 2005; Bi et al., 2011, 2014; Kim et al., 2011; Che et al., 2013)."

(4) Page 8, line 209: "compared to"

⇒ Change to "compared with"

(3) Page 8, line 219: change "literatures" to "literature" and modify the other places in the whole manuscript.

(6) Page 9, lines 259-260: “Note that the occurred months of PDU days are nearly different from TDU days at Dalanzadgad,”

⇒ Change to “Note that the occurred months of PDU cases are nearly different from TDU cases at Dalanzadgad,”

(7) Page 10, line 294: “and estimated SSA at 325 nm (~0.80) is much lower than at 660 nm (~0.95).”

⇒ Change to “and estimated SSA at 325 nm (~0.80) is much lower than that at 660 nm (~0.95).”

(8) 5. Summary, Page 17, line 494: change “PUD” to “PDU” and modify the other places in the whole manuscript.