ACP-2015-70, Huang et. al., anthro. dust

The authors have provided a thorough response to reviewers' comments and revised the manuscript accordingly where appropriate. There are a few points that need clarification and some English syntax that needs correction. Please consider the following suggestions by line number in version 3 of the manuscript.

51 (Tegen and Tung, 1995).
(Tegen and Fung, 1995).

61 Over the last few
62 decades, more frequent warmer and dryer winters and springs in
63 semi-arid and semi-wet regions (Huang et al., 2012),

81 drying water bodies),

141 (Liu et al., 2010). A parameter (CAD score) indicates a confidence at which a
142 feature (aerosol or cloud) can be distinguished using the CAD algorithm. Liu et al. (2010) revealed that the
143 feature classification is more reasonable if a higher magnitude of the absolute value of CAD
144 score is used and suggested applying a CAD score larger than 70. In
145 our study, we selected a features where the $|CAD| \geq 70$ as well.

174 precipitation and climate state. In this study, we use precipitation as a proxy
175 for climate state.

248 In this step, we determine and use .....

280 ..... Because anthropogenic dust has little seasonal dependence

and natural dust is at its minimum during dust in active season (e.g. Autumn for Northern China),

This phrase is not clear to me. The following is clearer. Read this carefully to make sure I've understood your point correctly.

Because anthropogenic dust has little seasonal dependence and natural dust is at its minimum during autumn in Northern China,

289 dust based on the set of entire height profiles from the Taklamakan and North China. Fig. 3 (b)

Related comment regarding Figure 3:

The black text does not have much contrast to the plot colors. Try white. Change the panel labels as follows:

(a) Entire profile

(b) PBL profile

293 ..... Furthermore, anthropogenic
294 dust has lower layer-integrated attenuated backscatter because anthropogenic dust
295 produced by human activities is generally mixed with other more spherical aerosol types within the
296 PBL.

328 Taklamakan, dust activity weakens rapidly in autumn, reaching a minimum in winter.

333 also shows that the Hexi Corridor is a transport pathway in East Asia, although

344 causing the entire mixture to be classified as dust and imparting larger values to our
345 DCB results.
It is only a bias if you consider Huneeus' result to be close to the true value.

353 China and India and biomass burning throughout the year in Africa when
354 farmers are preparing land for the agricultural season and grazing (Justice et al., 1996).
363 from deserts transported over anthropogenic source regions, and thus they tend to yield larger

370 60%. Lower percentages occur over places such as western North America, particularly the Great Basin, and North
373 precipitation for spring, summer, autumn, and winter. Although soil moisture is also related

386 ..... There is almost no
387 anthropogenic dust observed in arid regions because of minimal agricultural and
388 human activity and urban pollution sources.

Some North American geographical clarification follows in the next few comments. It is hard to know the regional geography and names over the whole globe.

421 ..... In North America, most dust sources are
422 centered in two eastern areas, the Great Plains and Upper Mississippi Valley and also in the Great Basin to the west of the continental divide.

423 .... A major difference from the results of Ginoux et al. (2012) is that on the east
424 side of the divide, anthropogenic and natural dust sources are intertwined, and on the
425 west side of the divide, the sources are predominantly natural rather than anthropogenic. The largest
426 anthropogenic DCBs are distributed over southeastern North America.

Regarding your discussion from figure 7, it seems that (except for S California's agricultural area with 80% anthropogenic sources) the percent of anthropogenic DCB in SE North America and the Great Basin is largely in the 20 to 40% range. By contrast the Great Plains region is about 60 to 85%.
Related question: What do the gray areas in figures 6, 7 and 9 represent? Are these areas of no, or insignificant, dust burden or are these pixels for which the confidence criterion of 70 was not met? Explain this in the caption for fig. 6.

485 ..... As identified in this paper, anthropogenic dust mainly comes from