

Interactive comment on “Detection of anthropogenic dust using CALIPSO lidar measurements” by J. Huang et al.

Anonymous Referee #2

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The manuscript proposes a new technique for distinguishing anthropogenic dust from natural dust is by using the CALIPSO dust and PBL height retrievals along with a land use dataset. By using this developed technique, the paper also presents the global distribution of anthropogenic dust and estimates the relative contribution of anthropogenic and natural dust sources to regional and global emissions. This is an interesting and important study, because anthropogenic dust has been poorly characterized in climate and environment issues. This topic fits very well into the scope of ACP. Generally, the manuscript is written in understandable English but needs to be improved for better clarity and coherence. The paper should be considered for publication only after making minor revisions as follows:

- 1) The abstract could be shortened, because the descriptions are repeated in line 2-3
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and line 15-16. 2) All “East China” could be better to be changed with “Eastern China”. 3) Page 10172, Line 20-21: “natural dust is at its minimum in autumn”, which could be only true over the Taklimakan desert. The seasonal changes of natural dust are different over the other deserts, even in the northern China. 4) In Figs. 6, 7 and 9, the white color bars are hard seen. Please modify them. 5) To better discuss the results of anthropogenic dust contribution to North American air quality, please reference this paper: Park, S. H., S. L. Gong, W. Gong, P. A. Makar, M. D. Moran, J. Zhang, and C. A. Stroud (2010), Relative impact of windblown dust versus anthropogenic fugitive dust in PM_{2.5} on air quality in North America, *J. Geophys. Res.*, 115, D16210, doi:10.1029/2009JD013144.

Please also note the supplement to this comment:

<http://www.atmos-chem-phys-discuss.net/15/C4727/2015/acpd-15-C4727-2015-supplement.pdf>

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 10163, 2015.