

Interactive comment on “Modeling the aging process of black carbon during atmospheric transport using a new approach: a case study in Beijing” by Yuxuan Zhang et al.

Anonymous Referee #2

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Modeling 1 the aging process of black carbon during atmospheric transport using a new approach: a case study in Beijing

Zhang et al.,

The work developed a new approach to simulate the BC mixing state based on an emissions inventory and back-trajectory analysis. They quantified the mass-averaged aging degree of total BC particles and found the aging process of BC during atmospheric transport showed that it strongly dependent on emission levels. In general, from the modelling development to the modelling implication, I think that the result is worth to publish in the ACP after one minor revision.

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Introduction P2L16-17 need references such as Li et al., JGR, 121(22), 13,784-713,798. P2L39 The author review several method to determine the BC particles. Also, Wang et al., ESTL, 2017 measure the Df in polluted air following soot particle aging. Does the model possibly consider the dimension fraction of BC? That would be more interesting. P7L24 deleted were P7L25 identified to indicated P7L27 import? Change the word P9L2-L3 Here it is possible to consider how RH influence BC coating? If the authors want to get the conclusion, firstly you need to exclude other possible factors..Therefore, as you try to do it. P9L6-13 Here some logical problem. if the aerosol in clean regions pass through the polluted area, how you know these BC don't deposit. How do you know BC at the sampling site were from clean region instead of the close polluted areas. Seemly, these are difficult questions about the mixture of air masses during the transport. How the authors separate them here? P10-P11, the implications and discussion should be combined? The implications should not be in Result section. The authors need to consider the structure in the two section. P12L10-11, capability should be individual BC or total here? My question is that the statement could be one problem. If you think total capability of BC in upper layer is higher that of BC in the lower. You need to know the BC distribution in the column within PBL. Normally the BC concentration is much higher than them in upper layer. Even mixing state is higher in upper layer but their concentration is lower. Therefore, the total capacity need be questioned. P12 section 5 concluding remarks. Most of them repeat the results or others. Is that possible to shorten it? The details should not be concluded here such as P13L2-5 and so on. The reference should be removed in the section.

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