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Interactive comment on "Modelling the optical and radiative properties of freshly emitted light absorbing carbon within an atmospheric chemical transport model" *by* M. Kahnert

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The author cuts the size range of aggregate up to Ns=350. It looks correct to cut the size range Rv around 0.17 as long as extinction effciency in Figure 2 is referred. However, the extinction efficiency is calculated based on "spherical particle model" not aggregate. Therefore judging the size range from the Figure 2 is incorrect. As shown in the paper by Liu and Mishchenko JGR doi:10.1029/2004JD005649 Figure 6, when we consider aggregates, the extinction efficiency does not largely decrease (like sphere) for increased number of composing particles (Ns). They are rather expected to have flat Cext for further increase of the Ns (see Figure 6 of them).

Moreover, researchers working on soot have shown that there are several thousands

(not hundreds) of composing particles seen in the soot from the electron tomography (e.g., L.H. vanPoppel et al. GRL doi:10.1029/2005GL024461, 2005).

From the Cext of aggregates shown in Liu and Mishchenko (2004) and study by van-Poppel et al. 2005, it is important to consider aggreagates composed of thousands (not only up to Ns=350). If this kind of extended calculation is computationally difficult, the author must denote that the paper based on the limited calculation and extended calculation to check the influence of increased number of composing particles required as future works.

Another thing to care is that the results of aggregates in Figure 9, 10 and 11 are obtained only for a single set of parameters. These limited-parameter-range results cannot be considered as "representative" of the general LAC properties. They may reflect part of the general property "by chance" but we cannot guarantee it by seeing limited range of results.

Future systematic study to reduce biases of the AOP and radiative forcing are required after this research paper.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 25443, 2009.