

## ***Interactive comment on “Evaluation of size segregation of elemental carbon emission in Europe: influence on atmospheric long-range transportation” by Y. Chen et al.***

### **Anonymous Referee #2**

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The manuscript, Evaluation of size segregation of elemental carbon emission in Europe: influence on atmospheric long-range transportation, by Y. Chen et al. provides a study of the evaluation for EC emission in Europe and the influences on transport and plume effect. Emission and transportation of EC is an important issue due to its health and climate effects. This paper is outlined logically and straightforward. I think that the paper can be considered for publication after some revisions according to the following comments.

(1) The authors address the importance of the size segregation information of EC particles. Unfortunately, there is little information provided in the text for the size information

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of EC from previous studies. Is there any data available for size-resolved EC measurements from HOPE-Melpitz Campaign? What is the particle mass size distribution of EC in this study?

(2) I can not find the definition of fine mode and coarse mode in this study. Are fine mode particles are sub-micron particles? Please specify it.

(3) Large uncertainties of the modeling results arise from the dry and wet deposition processes. I suggest that the authors should provide more discussions of the impacts of dry and wet deposition on their results.

(4) Weather patterns play a major role in determining the variabilities of aerosol properties. I suggest more information of meteorological processes and their relationship to aerosol properties need to be added in the discussion.

(5) P31063 Ln11, 'It indicates that there may be some unrealistic sources of particles larger than 2.5  $\mu\text{m}$  included in the model, which leads to the overestimation of coarse mode.' More information should be added for 'some unrealistic sources of particles large than 2.5  $\mu\text{m}$  include in the model'.

(6) P31064 Ln5, 'The model substantially overestimated the EC concentration in Melpitz especially for high episode peaks (Fig. 3a), during which the modelled EC concentration in 5 PM10 can reach up to about 3–4 times higher than that in PM2.5, while the average ratio between EC concentration in PM10 and PM2.5 is only 150%.' Such overestimation is mainly due to EC sources? More discussions needed for this issue.

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