

***Interactive comment on* “Estimating the influence of transport to aerosol size distributions during new particle formation events” by Runlong Cai et al.**

Anonymous Referee #2

Received and published: 26 September 2018

General comments:

This paper deals with an important topic for NPF measurement interpretation: estimating the effect of transport on the observed NPF events. The authors clearly explained how the population balance method can be used to evaluate whether the transport term is significant. Although some comments may be added to strengthen some points made in the paper, the paper is well written and the authors did not overstate their conclusions. I recommend this paper be accepted for publication after the authors address the two comments listed below as well as the issues brought up by the first referee.

Specific comments:

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1. My major concern with the current method is the neglect of transport on apparent particle growth: 'the contribution of transport on apparent diameter is neglected in this study' (page 6, line 12). Although it is possible the effect of transport on apparent particle growth is indeed negligible, the opposite may also be true: the observed growth is due to particle growth elsewhere, and these grown particles are transported to the observation site. As pointed out by the authors, for the south-east Tibet observation, the correlation between local wind field and estimated transport terms suggest the particles may have been formed elsewhere (page 10, line 19). It is my understanding that the application of equation 10 requires the growth term to be decoupled from the transport term; while inferring growth from the peak diameter shift does not guarantee this decoupling. I suggest the authors add more comments on this.

2. For the urban Beijing observations, the particle number concentration are quite high. In this case, it is possible that coagulation contributes to the apparent particle growth in this. For this data set, it seems that the authors didn't apply correction techniques, e.g. the method given by Stoltzenburg et al.(2005), to account for the coagulation effect on particle growth. After accounting for coagulation, to what extent will the growth term shift?

Technical corrections:

page 1 line 28: ... in a relatively clean atmospheric environment...

page 9 line 23: ...at different particle diameters are correlated with...

page 11 line 30: ... in a relatively polluted environment...

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2018-844>, 2018.

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