

***Interactive comment on “Impacts of
Regional-transported Biomass Burning Emissions
on Chemical and Optical Properties of
Carbonaceous Aerosols in Nanjing, East China”
by Xiaoyan Liu et al.***

Anonymous Referee #2

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The study quantitatively evaluated the influence of long-range transport of biomass burning (BB) emissions on carbonaceous aerosols in Nanjing city, China, which is helpful to understand the sources and associated contributions to aerosol carbonaceous component in urban regions in China. Following issues need to be addressed prior to publication.

1. One concern is about the relative contributions of long-range transport BB versus the local domestic BB emissions shown in Fig. 7. Though the levoglucosan concentration contained in air masses from southeast China is higher than that from the coastal

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region of eastern China, the air mass frequency from the latter air mass cluster (32.5%) is much higher than the former one (20%). After weighted with the cluster frequency, I would say the contribution from coastal eastern China actually is larger than that from southeast China. I understand that the long-range BB could contribute to aerosols in Nanjing significantly during certain time period, but, from long-term perspective, it might not be the case due to the large contribution from local domestic BB emissions. As such, the authors may want to make changes on the statements related to the contribution of long-range contribution.

2. The physical and optical properties of black carbon after emitted into atmosphere for certain time can be largely modified by the aging process (e.g., Peng et al., PNAS, 2016; Wang et al., JAMES, 2018). Please add some reviews regarding soot aging in the introduction section on page 4 when reviewing the alterations of physical and optical properties with the transport process.

3. In abstract: when talking about absorption of carbonaceous aerosols, the two terms (i.e., WSOC and water soluble BrC) are basically equivalent, but the authors switched back and forth to use them. Please stick to one expression.

4. Since the observations are ground-based, while the back-trajectory analysis focuses on 500m level. Are the conclusions about relative contributions from different air mass clusters sensitive to the selected altitude?

5. Typos Line 26 page 2: missing a preposition at “...frequently method biomass burning...”

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