

Interactive comment on “Large contribution of fossil-fuel derived secondary organic carbon to water-soluble organic aerosols in winter haze of China” by Yan-Lin Zhang et al.

Anonymous Referee #1

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This manuscript combined radiocarbon (^{14}C) and offline-AMS approaches and apportioned sources of organic carbon during an extreme haze episode in China. Here, ^{14}C results were reported for water-soluble OC (WSOC) and water-insoluble OC (WIOC), which enabled a more detailed and straightforward (or accurate) source apportionments of both WSOC and WIOC. Although, radiocarbon measurements of WSOC have been reported in many sites in East Asia and other sites around the world, here the offline-AMS measurements were combined with ^{14}C methods. The fossil and nonfossil sources could be further grouped into primary and secondary sources. Therefore, I think that the method is quite important and may be applied in other regions as well. The results are interesting and informative, which could be applied to some modeling

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studies in future. The MS could be published in ACP after the author could address the following minor comments.

Comments: In general, how was the relationship between levoglucosan and non-fossil WSOC (or other OC fractions)?

In the introduction part, I found the authors seems to miss some important references which have reported most recent source apportionment results in winter haze periods in East Asia.

“2.3 Offline-AMS measurement and PMF source apportionment” This part is a bit too long, and I suggest the authors only present the most important part and may cite some papers in any using the same method.

Lines 303-304: what were the major sources of non-fossil emissions in Guangzhou and Xi'an?

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2017-1130>, 2017.

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