

## ***Interactive comment on “Composition and origin of PM<sub>2.5</sub> aerosol particles in the upper Rhine valley in summer” by Xiaoli Shen et al.***

### **Anonymous Referee #1**

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#### General comments:

The present work conducted a 6 week measurement of particle chemical composition combining LAAPToF and AMS technique at a rural site of southwest Germany. Also the regional transport model COSMO-ART was used to investigate particle sources as well as their transport pattern. The combination of measurement and model can better understand the particle sources and regional transport. The results are straight forward and useful, but some clarification and minor changes are still needed for this manuscript. I suggest a minor revision for this manuscript before publication.

Specific comments: Āñ Line 18: It’s a little confusing with the statement: sodium salts accounted for 36%, but organics, sulfate, nitrate, and ammonium accounted for 58%, 22%, 10%, and 9% (sum up 99%). I believe that the total mass the authors used for

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AMS is the sum of org and SNA. While LAAPToF measures not only non-refractory particles. It seems these results cannot be closure, especially for some readers who are not very familiar with these two instruments. Anyway, some clarification is needed to avoid misunderstanding these results. ¶ Line 123: Do AMS use PM2.5 lenses? ¶ Line 121: It's no need for this too many references here. ¶ Line 195: Since the MS discussed long-range transport, I suggest discussing more about secondary aerosols as well. ¶ Line 188: I suggest to explain a little bit about the particle classes, not only show the names, because not all the readers have read the paper (Shen et al. 2019) ¶ Session 3.4.1 and 3.4.2: Because SOA is also an important component of fine particles, I suggest discussing more about SOA. Besides, AMS-PMF can provide OOA (SOA). This could be considered in the discussion. ¶ Session 4 conclusion: More implication should be provided, because this work presents a method of combination of field measurement and model. Can this method be expanded to other places and time? Otherwise this work is only a very local study.

Please also note the supplement to this comment:

<https://www.atmos-chem-phys-discuss.net/acp-2019-441/acp-2019-441-RC1-supplement.pdf>

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