

Atmos. Meas. Tech. Discuss., referee comment RC2
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Comment on amt-2022-84

Anonymous Referee #2

Referee comment on "A study on the performance of low-cost sensors for source apportionment at an urban background site" by Dimitrios Bousiotis et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2022-84-RC2>, 2022

The authors present a new methodology for using LCS for source apportionment. This is an important topic as being able to extract source information from LCS AQ data would immensely improve the utility and power of LCS. Overall I think the paper is adequate for publication subject to minor revisions.

Specific comments:

1. I think the paper overall, but especially the abstract, could be a little more quantitative in its description. The abstract contains several instances of describing results qualitatively (e.g., "provide results that were consistent with a previous study" line 28; "good consistency between results", line 35, etc). It would be better to provide the numbers/statistics that show this rather than just telling the reader that the results were consistent.
2. There is no discussion or citation of the performance of the Alphasense OPC-N3, which is critical in interpreting the source apportionment results. Have the authors compared the PNSDs from the Alphasense to any reference field monitors or lab instruments? The performance of these optical particle counters through publicly available resources such as AQ-SPEC is fairly mixed.
3. Line 203 mentions separate NO/NO₂ LCS data. Is this from the "Box of Clustered Sensors"? It's a little unclear what devices are being used here. I have a similar concern with the quality of the data here as well, as several studies have shown that the NO₂ from alphasense gas sensors are not very reliable

4. The data showing the source apportionment from the LCS alone (particles and gases) seems to be of weaker utility than when the ACSM is brought in. In particular LC4 does not really have any source condition associated with it, as the authors mention. I find the statement on line 461-462, saying that hyperlocal source apportionment is now possible with only LCS, to be exaggerating a little bit. I'd recommend softening that or at least adding in the caveats that some sources can't be well characterized. The way it is written now somewhat oversells the results, I think.