

Atmos. Meas. Tech. Discuss., author comment AC2
<https://doi.org/10.5194/amt-2021-285-AC2>, 2022
© Author(s) 2022. This work is distributed under
the Creative Commons Attribution 4.0 License.

Reply on RC2

Christopher D. Wallis et al.

Author comment on "An instrument for direct measurement of emissions: cooling tower example" by Christopher D. Wallis et al., Atmos. Meas. Tech. Discuss.,
<https://doi.org/10.5194/amt-2021-285-AC2>, 2022

Thank you for the comments and suggestions, we find them to be helpful. We will incorporate them into the revision of the paper. Responses to some specific questions are also below:

The manuscript presents a method to measure aerosol emission from cooling towers using direct dried-aerosol sampling techniques, both off- and online. The authors use two sets of instruments; aloft and ground-based. The latter one is used as reference to correct for sampling losses in the aloft setup. The normalization is done using PM10 and PM2.5 passive sampling but a comparison of the APS results is missing. I suggest the authors to provide a comparison of the size distributions obtained by APS measurements in order to improve the manuscript. The paper is well written and should be published after considering this suggestions and the following minor comments.

We will compare APS results from the two sampling trains along with field findings in a subsequent manuscript describing dried aerosol findings.

What would be the expanded uncertainty of the method?

We have updated the discussion of this method to include total uncertainty.

How far from the tower is the parallel set of measurements located?

The exact distance from the tower to the parallel measurement varied between towers, but was approximately 100 feet (30m). Positioning of the ground-based instrument was such that it was representative of the intake of the cooling tower but avoided emissions from the ground-based generator and exhaust from the crane, and was subject to different physical layout constraints at each site. The paper has been updated to include this information.

Table 2: Please report standard deviations for the values shown here. Please fix the units to $\mu\text{g}/\text{m}^3$

The chart shows two individual test results, so there is no standard deviation to report. We have added uncertainty for this data collection method to the table.