

Atmos. Meas. Tech. Discuss., referee comment RC3
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Comment on amt-2021-360

Anonymous Referee #2

Referee comment on "Air quality observations onboard commercial and targeted Zeppelin flights in Germany – a platform for high-resolution trace-gas and aerosol measurements within the planetary boundary layer" by Ralf Tillmann et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2021-360-RC3>, 2021

Tillmann et al. provide an overview of the utilization of a new Zeppelin research platform equipped with instrumentation for air quality studies. They provide some examples of the unique sampling strategies that can be provided with such a platform (i.e. details of the vertical structure of the boundary layer) and the use of the platform to evaluate an emissions inventory.

Generally I think that what is presented is well done. Since the paper is submitted to AMT, I was expecting some more details on the evaluation of the data quality from the different instruments onboard. As far as I can tell, the measurements presented are only from the MIRO instrument. I think it would be appropriate to have a section discussing the data quality from the less expensive chemical sensors, and comment on their utility for the future. Was the intention of integrating them along with the MIRO to evaluate them, or was it to possibly rely on those only in the future for this or other platforms?

On the MIRO side, not all of the chemical measurements were discussed. I think it would be good to comment on the SO₂ and NH₃ data quality, since these are important for air quality studies and the use of a single instrument capable of providing all of those measurement would be really of wide interest. As the manuscript is though, we don't know if those measurements were deemed to be of sufficient quality for air quality research.

I think that it may be appropriate for a revised version of the paper to be published in AMT, but think that first the sections that deal with the instrumentation should be expanded a bit to:

- Provide some comments on the observed data quality or issues from the MIRO, for example how much did the zeros drift?
- Expand the data discussion to comment at least on the SO₂ and NH₃ measurement, and
- Compare the measurements between MIRO and the sensors.