

We first thank the referee for his review and for his constructive remarks, which were used to improve the manuscript. Our replies to the referee comments are in italic, the changes in the manuscript are in bold.

Measurement capability and errors are well described, however the conclusions miss a discussion on suitability of the SWING payload as air quality monitoring tool. Though it is obvious that losing the auto pilot option presented a major shortcoming for the AROMAT mission, the manuscript would strongly benefit from a discussion on what has been learned from this campaign on the suitability for more regular monitoring missions and what are the points that are being addressed in the next campaign. Please also explain how the H₂O measurements fit into this greater picture.

We have expanded the conclusion to take into account the referee comment, which addresses the different points mentioned by the referee. A dedicated paper is in preparation for the overview of what was learnt during the AROMAT-1 and AROMAT-2 campaigns.

Regarding the H₂O vmr measurements, the result came out of the sounding flight but the latter was initially dedicated to NO₂. It appeared that, for the UAV and for the balloons, so close to the source, it was actually difficult to fly well inside the narrow plume, so we could not get the NO₂ vmr from the spectra. Nevertheless, we consider it worth to do the analysis for H₂O since the same scheme can be applied to NO₂ in a place with a more homogeneous NO₂ surface layer. Beside that, knowledge of relative humidity is also useful to estimate the optical properties of the aerosol affected by hygroscopic growth, for instance with the widely used OPAC aerosol model. We added a sentence mentioning this with the reference in section 4.4:

This information could be used to estimate the optical properties of aerosol growing with increasing relative humidity, using for instance the OPAC model Hess(1998).

Specific comments:

Abstract: please include the purpose of the AROMAT campaign, e.g. testing payload
Feasibility

We have modified the abstract adding in the second paragraph after AROMAT

which was dedicated to test newly developed instruments in the context of air quality satellite validation

p.2., line 16ff: paragraph could be shortened, since focus is on unmanned vehicles

It is true that we focus on UAV but we also present measurements from a manned aircraft in the paper (AirMAP from the FUB Cessna). Moreover, there are not many DOAS studies from UAVs yet and our work builds at least as much on previous DOAS experiments from traditional aircraft than on other UAV atmospheric experiments cited in the first paragraph, which are mainly in situ experiments. Therefore, we prefer to keep these manned aircraft references.

Since references are not complete, I recommend using "e.g." for citations.

We agree with this remark and have inserted “e.g.” in the first and second paragraph at the five places where a list of studies was used to give examples.

p.2. line 32, please consider citing a newer reference

We agree that the reference from 2006 does not appear wise when writing “currently”, so we have replaced this reference by

Krotkov, N. A., Lamsal, L. N., Celarier, E. A., Swartz, W. H., Marchenko, S. V., Bucsela, E. J., Chan, K. L., Wenig, M., and Zara, M.: The version 3 OMI NO₂ standard product, Atmos. Meas. Tech., 10, 3133-3149, <https://doi.org/10.5194/amt-10-3133-2017>, 2017.

Figure 4: please define or omit “golden day”

We have replaced in the figure caption ‘golden day’ by ‘AROMAT campaign’, as the mobile DOAS and SWING measurements were always performed around these same places during the campaign.

Technical corrections:

P1., line 14 and ff: “molec.cm-2” Is this properAMT style or should it be molec. x cm-2?

The Copernicus guidelines only state that “Units must be written exponentially (e.g. W m⁻²)”. We removed the dot from our initial formulation, writing: ‘molec cm-2’. This format is used by many other published studies in AMT. All the units were changed across the paper to follow this convention.

p.2, line 4: “wingspan wider than”

Done.

p.5., line 10: “280m” is missing space

Done.

p.7, line 5: remove “)”

Done.