

Referee 2

The development of an automated online field instrument to quantify the oxidative potential of aerosol via ascorbic acid oxidation is presented in this manuscript. The authors conducted a series of calibrations of aerosols with known sources or compositions as well as reported data from ambient measurements. The use of fluorescence detection is important to avoid background interference from absorbance-based measurements. I think the manuscript is well written and the data is carefully analyzed. I have a few clarifying questions for the authors listed below.

- How did AA maintain freshness for multiple days of field measurements?

To clarify that we changed the sentence starting at line 22 to: “To reduce oxidation and keep the solutions fresh over multiple days, the AA and OPDA solutions in the reservoir were continuously degassed with 50 ml/min of N₂. There was only a minimal increase in the blank signal over time, which was detrended by a linear fit if necessary.”

- Would the change in AA concentrations in the instrument over time (via natural decay) affect the kinetics of AA-aerosol oxidation reactions?

The decay rate of the AA is relatively slow, and in measurement campaigns is regularly replenished every ~2 days, so the decay of the initial AA concentration is not more than 5%. The AA is also in substantial excess compared to redox-active aerosol components, particularly during ambient sampling. Therefore, we do not expect these small changes in AA to affect OP measurements.

- A limit of detection for urban ambient aerosol measurements was reported to be around 5 µg/m³. Given that different types of aerosol components may have very different reactivities towards AA oxidation, do the authors have any information about what major aerosol composition contributes to the current observation?

This is a very good point, but unfortunately, we don't have this information. This publication is focussing on a detailed characterization of the OOPAAI and a proof-of-principle for an ambient atmosphere application. A full characterization of the ambient aerosol and which ambient particle components contribute to the OOPAAAI signal, would go beyond the scope of this paper.

- How was the slope for ambient measurements determined? (Line 410)

This might be a misunderstanding. The “slope” in line 426 (equation 1) is the slope of the DHA calibration curve (see Fig. 4) and is used to convert counts into DHA concentrations.